

AGRICULTURAL RESEARCH INSTITUTE
PUSA

THE JOURNAL

OF THE

Department of Agriculture

OF

SOUTH AUSTRALIA.

ISSUED UNDER THE AUTHORITY OF THE HON. MINISTER OF AGRICULTURE.

Vol. XIII.--August, 1909, to July, 1910.

312129



IARI

Adelaide:

R. E. E. ROGERS, GOVERNMENT PRINTER, NORTH TERRACE.

1910.

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THE JOURNAL

OF THE

26 APR 1993

**Department of Agriculture
OF SOUTH AUSTRALIA.**

No. 7.

AUGUST, 1909.

Vol. XIII.

Published Monthly by the Department of Agriculture.

All communications to be addressed:

"The Editor, Journal of Agriculture, North Terrace, Adelaide."

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E. H. COOMBE

Minister of Agriculture.

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POINTS FOR PRODUCERS.

Our Flocks and Herds.

The final returns of the live stock in South Australia for the year 1908 show fairly satisfactory increases over the figures of the previous year. On December 31st, 1908, there were within South Australia proper 213,385 horses, 340,376 cattle, 6,898,451 sheep, 78,454 pigs, and 14,611 goats. The Northern Territory figures do not materially increase these totals, with the exception of those for cattle and goats, there being 407,992 cattle and 20,964 goats in the Territory. The total figures for South Australia and the Territory are :—Horses, 235,136, an increase of 8,604; cattle, 748,368, an increase of 39,014; sheep, 6,952,499, an increase of 78,630; pigs, 81,165, a decrease of 12,440; and goats, 35,575, an increase of 5,649. The slaughtering returns show that 1,212,868 sheep, 67,369 cattle, and 58,909 pigs were slaughtered during 1908, the increase over the previous year being 192,648 sheep and lambs, 9,139 cattle, and 4,357 pigs. It is an interesting fact that the number of sheep and lambs slaughtered practically represents the natural increase of the flocks after allowing for mortality, as the increase of 78,630 is almost wholly made up of the excess of sheep imported over those exported.

Next Year's Laying Competitions.

The Poultry Expert writes :—"It is intended to continue the egg-laying competitions at Roseworthy, and provision has been made for 150 pens next year. This will establish an easy record for any one competition, and little, if any, difficulty will be experienced in obtaining the number of entries. At the Kybybolite Poultry Station, near Naracoorte, a competition will also be held. The Commissioner of Crown Lands (Hon. E. H. Coombe, M.P.) has authorised the necessary extension of the poultry station, which will provide accommodation for 50 pens in the laying competition, while 500 or 600 layers will be kept for egg production. At Roseworthy there will probably be three or four sections, to encourage selection and breeding of such varieties as Minorcas, Leghorns other than white, Andalusians, Anconas, Campines, &c. At Kybybolite there will probably be only two sections—light breeds and heavy breeds—a matter which cannot be definitely settled until later on, when preliminary entries are to hand. The present intention is to limit this competition to residents of the South-East, but just where the dividing line will be drawn depends on the support received. I should like to fix Keith or Bordertown as the northern limit, but may have to make the line

10 or 20 miles south of Adelaide. Up to the present excellent support has been promised. There will be liberal prize-money and, of course, the competitions will furnish one of the best means of advertisement possible. All poultry entered must be pure bred."

Trial of Stone-Gathering Machines.

A trial of stone-gathering machines will be held near Paskeville on Friday, September 3rd. The Paskeville Branch of the Agricultural Bureau is making all the necessary arrangements for selection of site for trial, and is providing the horses necessary to work the machines. The trial is for the bonus of £100 offered by the Government, and is under the direction of a committee of the Advisory Board of Agriculture, consisting of Professor Perkins and Messrs. G. R. Laffer and A. M. Dawkins. Machines have been entered by Messrs. J. von Bertouch, of Kapunda; W. Heithersay, of Petersburg; J. C. Davies, of Port Pirie; Clarence H. Smith, of Ardrossan; and A. Burnham of Burra Burra, New South Wales.

Mortality of Live Stock.

Some interesting information is furnished by the Government Statist in statistics lately issued respecting the principal causes of the mortality of live stock in South Australia. During the last two years farmers have been asked to show in the returns which they have supplied to the Statistical Department the number of cattle that they have lost through dry bible and other causes, the number of horses that have died, and the mortality amongst sheep, specifying the causes—such as killed by dogs and foxes, drought, and natural causes. During 1908 there were 11,133 deaths of cattle both within and outside counties, dry bible being responsible for more than one-fifth of the number, namely 2,395. These cases of dry bible were all reported from within counties, where the deaths of cattle from other causes were 6,660; so that that mysterious disease carried off more than one-third of the cattle in what may be regarded as the settled part of the State. There were 6,800 deaths of horses in the year, and over 250,000 deaths of sheep, the causes ascribed being as follows:—Dogs and foxes, 76,029; drought, 78,514; natural causes, 97,990. As compared with the figures of 1907 there was increased mortality in cattle, horses, and sheep last year, and, so far as sheep are concerned, there is a significant increase of over 50 per cent. In 1907 there were 47,480 deaths from dry bible, 20,822 from drought, and 99,139 from natural causes total 167,441. The rate of mortality works out in each

case as follows :—Horses, 2·4 per cent.; cattle, 2 per cent.; and sheep, 3·6 per cent. The heavy mortality in sheep certainly warrants some inquiry, and the following figures furnished by the Government Statist should well repay study by sheepowners :—

	Dogs and Foxes.	Drought.	Natural Causes.	Total.
Within counties	46,979 ..	57,732 ..	86,077 ..	190,788
Outside counties	29,050 ..	20,782 ..	11,913 ..	61,745
Total 1908	76,029 ..	78,514 ..	97,990 ..	252,533
Total 1907	47,480 ..	20,822 ..	99,139 ..	167,441
Increase	28,549 ..	57,692 ..	— ..	85,092

Arsenate of Lead Poisoning.

Although it has been satisfactorily demonstrated that there is no danger whatever to the consumer of fruit sprayed with arsenate of lead at the strength recommended, there is always the possibility of accidental swallowing of some of the poison. In this connection the following extract from a report by the well known makers of arsenical preparations, Messrs. Lewis Berger and Sons, Limited, of London, is of interest, and should be noted for use in case of emergency :—“The amount of poison that would be taken by eating fruit or vegetables sprayed with a mixture in the proportions given is so small as to be absolutely harmless. Arsenate of lead taken internally, however, is very poisonous, and emetics of mustard or salt in warm water should be immediately and freely given, followed by large doses of castor oil. After vomiting, give large quantities of mucilaginous drinks, such as white of eggs, milk and honey, and limewater.”

Smut in Cereals.

In a recent bulletin issued by the New Zealand Department of Agriculture reference is made to the difference in the life histories of the different types of smut in cereals. Oats, barley, and wheat are each attacked by “loose-smut” which develops in the head, and the young grains are destroyed, their place being taken by millions of black spores, which blow about in the wind when mature. These spores are loose, and not covered as is the case with the ball-smut of wheat (bunt) and barley. It has been proved, first by Mr. Frank Maddox, of Tasmania, in 1897, and later by European and American scientists, that infection of wheat and barley with loose-smut takes place at the time the plants are flowering. This, of course, accounts for the fact that pickling the seed does not always prevent loose-smut of wheat.

This disease must not be confounded with ball-smut or bunt, from which it differs in the very material point in its life history; infection by ball-smut can only occur at the germination or seedling stage. Pickling is an almost certain preventive of ball-smut of wheat and barley, but is not too reliable with loose-smut. A correspondent asks whether smut attacks other plants than wheat, oats, and barley, and the reply is, yes. Maize, sorghum, and quite a number of grasses are attacked by smut. The disease, however, is not communicated from, say, grass to wheat, or wheat to oats, each smut being a distinct fungus.

Pure Seeds.

In Maine, United States of America, stringent legislation in respect to the purity or freedom from foreign seeds of agricultural seeds is enforced. Every lot of seed sold, offered, or exposed for sale must be accompanied by a written or printed guarantee of the percentage of purity. The Experiment Station undertakes, free of cost, to examine any samples sent in by dealers and others, in order to assist them to decide as to the quality of the seeds. While it is admitted by the authorities that the Maine wholesale houses cannot purchase outside the State any seeds with the necessary guarantee, it is pointed out that no outside dealer can sell in Maine State, and consequently any expense or trouble the former are put to in testing seeds is more than balanced by the fact that they have the command of the local trade. In the tests made by the station in 1907 it was found that a considerable number of samples were under 90 per cent. pure. One sample of "Choice Clover" contained 24·6 per cent. of impurity, while several samples of Red-top grass, branded by the sellers as "clean" or "fancy," contained from 32 per cent. to 22 per cent. of impurities.

Dairying in Victoria.

Dr. Cherry, Victorian Director of Agriculture, points out in an article contributed to the Victorian *Journal of Agriculture* that the dairying industry, as represented by the exports of butter, is not only stationary, but is actually retrograding. "Several causes," he says, "may be found for this state of affairs. Dairying is often looked upon as a stepping-stone to some lighter form of occupation which involves less continuous labor, such as stock-fattening or wheat-growing. As soon as a family finds itself in a position, from the profits made from the cows, to go into a less laborious although less lucrative enterprise, a clearing sale is held. I do not think that we can complain of this movement, however much we may regret it. The daily milking, morning and evening, year in and year out, is an occupation which is attractive to very few. The remedy for this phase in the history of the industry is to show that dairy-farming can be carried on in such a way that the present profits can be enormously increased; so that where a family has

several hundred acres of land in a district of good rainfall the farm can be made a business concern of such size that the proprietor requires to devote the whole of his time to managing his estate. He should no more think of doing the work of a milkhand day after day than the contractor for a line of railway thinks of earning his profits by pushing a wheelbarrow all day long." The essentials of success are defined by Dr. Cherry as follows :—" A—The plough must be used to provide sufficient fodder to keep the cows in milk the whole year round. B—On everything except the richest ground the manure from the cows must be systematically utilised in order to increase the fertility of the farm. C—Proper records must be kept of each individual cow, so that the unprofitable ones may be culled out and the general character of the herd improved from year to year."

Forcing Grapes Through the Agency of Candy Sugar.

A correspondent forwards the following extract from *Le Matin*, of December 20th, 1908 :—" For the botanist there is no obstacle. A young scientist, Mr. Leon Pauchet, who works in the laboratories of Prof. Gaston Bonnier, at the Sorbonne, has just found a means of hastening the maturity of the vines by two or three weeks. The sun, which so slowly gilds the heavy bunches, is here advantageously replaced by a sugared solution. Of course, sugar is carbon, and carbon is condensed sun. This is how our young botanist proceeds : The terminal branches bearing the bunches first receive an incision under the bark, and are then curved down obliquely and soaked in jars containing a solution of candy of 12 per cent. to 14 per cent. This must be done just after flowering, at the time when the young grapes can be seen, and the absorption must not last more than three weeks. This can then be repeated with another branch on the same plant. In hot houses grapes have thus been able to ripen 20 days before the others at a trifling cost. Mr. Pauchet has tried some further improvements, and has been able to give the grapes a taste which was not theirs. Raspberry juice, distilled at a low temperature, and mixed in the jars with the sugared water, has communicated its taste to the bunch experimented upon. Thus now the botanist will be able to give us grapes tasting like raspberry, strawberry, pineapple, or blackcurrant."

Agriculture and Capital.

People will have it that agriculture does not pay. It does not, very likely, on the old lines. But no calling pays better in small hands when there is plenty of money to work it with. Only, in all our callings—agriculture has been the last to learn the lesson—the rule of the present day is : you must have plenty of *working capital*. It is not the food which just supports the life

of a beast which earns a profit, but the extra hundredweight of cake or meal which lays on the flesh and fat. It is not mere delving or ploughing of the soil that makes farming remunerative, but the manure put into it. And of such fertilising material the last bag or hundredweight earns a profit out of all proportion to that earned by preceding ones. . . Of course, judicious employment must be taken for granted. But all knowledge and skill, all foresight and calculation will be thrown away if we have not got the money.—
HENRY W. WOLFFE.

Live Stock in Argentina.

After an interval of thirteen years a census of live stock has been taken in the Argentine Republic, and, in view of the growing importance of that country as a factor in the world's meat supply, the figures are of considerable interest. They show generally that the stock of cattle has increased by one-third, while sheep, on the other hand, have decreased by about 10 per cent. The increase in the number of cattle is distributed over all parts of the Republic, though it occurs chiefly in the Provinces of Buenos Aires, Santa Fé, Corrientes, and Cordoba, and it would seem that this increase has been to some extent secured by a displacement of the sheep. This is particularly noticeable in the Province of Buenos Aires, where, on the one hand, the stock of cattle has risen from 7,746,000 to 10,351,000, while on the other the stock of sheep has diminished from 52,630,000 to 34,605,000. Decreases in sheep are also recorded in Santa Fé, Cordoba, Jujuy, and Pampa Central, but in all other parts there has been an increase in the sheep stock, though it has not been sufficient to counterbalance the very heavy diminution in Buenos Aires. It seems fairly evident, however, that there has been a marked transference of the sheep-breeding industry from the more thickly populated districts, where land has risen in value, to the interior and less-cultivated regions. Some of the Territories, such as Rio Negro, Neuquen, Chubut, Santa Cruz, and Tierra del Fuego, which in 1895 only carried about 1,800,000 sheep, now return in all 11,250,000 head. According to a summary in the *Buenos Aires Standard*, the total figures for the three national censuses are as follows:—

	In Thousands. 1888.	In Thousands. 1895.	In Thousands. 1908.
Cattle.....	21,964	21,792	29,117
Sheep	66,701	74,380	67,212
Horses	4,263	4,446	7,532
Pigs	403	653	1,404

Of the cattle, 984,000, or nearly 3·4 per cent., are classed as pure-bred, 15,060,000, or 51·7 per cent., as cross-bred, and 44·9 per cent. as native; 1,179,000 sheep, or 1·75 per cent., were pure-bred, 55,449,000, or 82·5 per cent., were cross-bred, and 15·7 per cent. native.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence for this department should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

SHELL SAND.

"G. F. U." forwards a sample of small shells—usually called shell sand—and asks whether it is of any value other than as poultry grit.

The Inspector of Fertilisers replies:—"This shell sand consists largely of lime, the percentage varying considerably. For heavy land and sour soils it is valuable, owing to the chemical and mechanical action of the lime. Large quantities of this material are used by farmers near the Gawler Beach, where there are immense deposits."

KEDZIE'S SOLUTION.

"A. B.," Clare, inquires why Kedzie's solution, prepared strictly in accordance with instructions, should burn the trees at times. Should it be used immediately it is made, or mixed some time beforehand?

Reply:—"The actual cause of burning is not known. Many growers use Kedzie's solution without injury, while others find that it is unsafe on account of its irregularity in regard to burning. The trouble may be due to unsuitable lime, to either the lime or the water containing ingredients that set free some of the arsenic, or to the condition of the foliage, &c., due to the climatic conditions. In some parts of the United States considerable injury has been reported at times with other forms of arsenical compounds, and it has been found that in many cases either the water or the soil is alkaline. The Kedzie solution (without lime) may be kept for a long period without injury. It is a good practice to mix the limewater with the arsenical solution for some time before using, as there is then less risk of burning."

BROODINESS.

In reply to "A. C.," Payneham, the Poultry Expert writes:—"Pollard does not induce broodiness. Long years of careful selection have resulted in establishing breeds of fowls among which the instinct is seldom observed

in action. The elimination of the tendency to broodiness is due to selective breeding. Recent advances in the knowledge of heredity, due to the application of Mendel's law of segregation, afford convincing proof that broodiness is dominant to non-broodiness. The broody instinct is in all fowls, although not necessarily in evidence. The mating together of two closely bred fowls, in each of which the hidden tendency exists, will so intensify it in the progeny that in due course the pullets may exhibit a desire to sit. Our breeders of late have been line-breeding to a considerable extent, mainly with the view of maintaining and improving laying. They have not, as a rule, taken any steps to breed out the tendency to revert to broodiness."

THE CHOICE OF YOUNG APPLE TREES.

"E. C. G." asks :—"Is it advisable, or otherwise, to plant an orchard with apple trees reared by grafting and budding in the same district, the stocks and buds being also off trees grown in the district? Would anything be gained by securing trees reared out of the district entirely?"

The Horticultural Instructor replies as follows :—"As a rule, there are many advantages attached to planting trees raised in the same climate and soil as the orchard will occupy."

WASTE CARBIDE.

"A. B.," Clare, asks whether the waste carbide from acetylene lamps would be injurious to trees if used in the orchard.

Reply :—"If the material is exposed to the air for some time before being used it would not do any harm if worked into the soil. At the same time, care should be taken not to apply it on the foliage of plants."

SLUGS.

"A. B.," Clare, writes :—"Can you tell me how to keep down slugs in the vegetable and flower garden. It is quite useless to lay out old bags, boards, etc., as traps; the slugs are too numerous. The garden is kept clean and free from rubbish and other shelter, yet the only vegetables they will leave alone are onions and carrots."

Mr. W. L. Summers replies :—"‘A. B.’ is experiencing the same trouble as many others this winter. Probably the mild winter and comparative absence of frost is responsible for the prevalence of slugs. Complaints of unusual damage are numerous. Freshly slackened lime distributed freely in the vegetable garden about 9 o’clock at night is about the best remedy I know of. It is true that the destructive properties are lost as soon as the lime gets wet, but several applications will materially lessen the pest. Mineral or bone super. sprinkled on the soil are also useful, and retain their caustic properties longer. Powdered tobacco is destructive to young slugs, but the

mature slugs do not appear to be injured. For the flower garden lime and soot, super., or tobacco dust should be used. All this means work and expense, but that is the price of success."

MANGOLDS.

"A. J." inquires :—“(1) Can mangold seed be sown with ordinary drill ; (2) is artificial manure useful ; (3) what amount of seed per acre is required ; and (4) what manures should be used in hilly country with rainfall of about 30in.”

The Inspector of Fertilisers replies :—“Under somewhat similar conditions, Mr. W. Pearson, of Meadows, reported growing heavy crops of mangolds under the following treatment :—Apply a good coating of stable manure, and plough under deeply in May ; in July apply 4cwt. to 6cwt. per acre of bonedust, and plough it in. About end of August work lightly and sow seed in drills about 2ft. apart. In November or December thin out to about 18in. in the rows. About 4lbs. or 5lbs. of seed per acre would be required. If the seed is mixed carefully with some bonedust it can be sown thinly, and less seed is required—also much less thinning. Bone manure or bone super. may be substituted for bonedust. Thorough preparation of the land, liberal manuring, and surface cultivation between the rows are required to secure highest results.”



ORCHARD AND HOMESTEAD.

ALBERT MOLINEUX MEMORIAL.

SCHOLARSHIPS AT ROSEWORTHY COLLEGE.

The news of the death of Mr. Albert Molineux, the founder of the Agricultural Bureau of South Australia, has been received with deep regret by the members of the Branches of the Bureau. A large number of the Branches have formally recorded on their minutes their appreciation of the work of the deceased gentleman, and their regret at his death.

It has been suggested that the members of the Agricultural Bureau and other organizations with which Mr. Molineux was connected for so many years should commemorate in some suitable way the valuable services rendered by him to the agricultural community. The members of the Advisory Board of Agriculture are of opinion that the most appropriate memorial would be a permanent "Albert Molineux Scholarship" at the Roseworthy Agricultural College. To establish such a scholarship to be offered for competition every third year would require about £800, while for £1,600 two such scholarships could be offered. In view of the fact that for over 40 years Mr. Molineux was an earnest advocate of scientific methods of agriculture in all its branches, the Board is of opinion that a scholarship to enable young men to secure a training in scientific agriculture would be a singularly appropriate recognition of his work.

It is not necessary to refer again in detail to Mr. Molineux's work. It suffices to say that he was the founder, and for many years Secretary, of the Agricultural Bureau; he was one of the first to advocate the use of fertilisers, fallowing, and mixed farming; to his persistent advocacy of the value of Bordeaux Mixture for the prevention of scab in apples and pears, shothole in apricots, and other fungus diseases, and of arsenical sprays for suppression of codlin moth our fruitgrowers are largely indebted.

In these circumstances the Board feels that it is justified in asking each and all interested in our agricultural industries to contribute to the proposed fund. All subscriptions should be sent to the "Secretary Advisory Board, Department of Agriculture, Adelaide," and the Board appeals for liberal and prompt response, as the members would like to be in a position to announce the successful issue of the movement at the September Congress of the Agricultural Bureau.

Each member of the Agricultural Bureau has been asked to help this movement, not only by subscribing himself, but by bringing the matter under the notice of any of their neighbors who are not connected with the Bureau.

The hearty co-operation of Bureau members is required to make a success of this memorial, and the Advisory Board feels that it can depend upon them for their help.

The following amounts have already been subscribed to the fund :—

	£ s. d.
C. J. Tuckwell (Advisory Board)	10 0 0
W. J. T. Clarke, Mount Gambier	1 1 0
Prof. A. J. Perkins (Advisory Board)	1 0 0
M. Manning, Eurelia	0 10 6
G. L. Ferguson, Petersburg	0 5 0
W. L. Summers (Advisory Board)	2 0 0
J. Porter, Kenton Valley	1 0 0
O. Sassanowsky, Mount Gambier	1 1 0
B. G. Harris, Green's Plains West	1 1 0
T. Pengilly, Aldinga	0 10 6
G. R. Laffer (Advisory Board)	1 1 0
J. W. Sandford (Advisory Board)	5 5 0
Col. Rowell (Advisory Board)	0 10 6
H. Martin, Eudunda	0 5 0
F. H. Neate, Caltowie	0 10 6
B. Varcoe, Millicent	0 5 0
Jno. Turner, Smith's Bay, K.I.	1 1 0
C. J. Valentine (Advisory Board)	1 1 0
E. & W. Hackett, Adelaide	2 2 0
A. M. Dawkins (Advisory Board)	1 10 0
W. Dare, Mount Bryan East	0 10 0
A. McKenzie, Minlaton	1 0 0
W. Short, Winulta	0 10 6
Buring & Sobels, Watervale	1 1 0
G. S. G. Thomas, Tarlee	0 5 0
A. B. Wishart, Warratta	1 0 0
P. R. Pascoe, Clare	1 1 0
S. Sleep, Nantawarra	1 0 0



CARTING FIREWOOD IN THE INTERIOR.

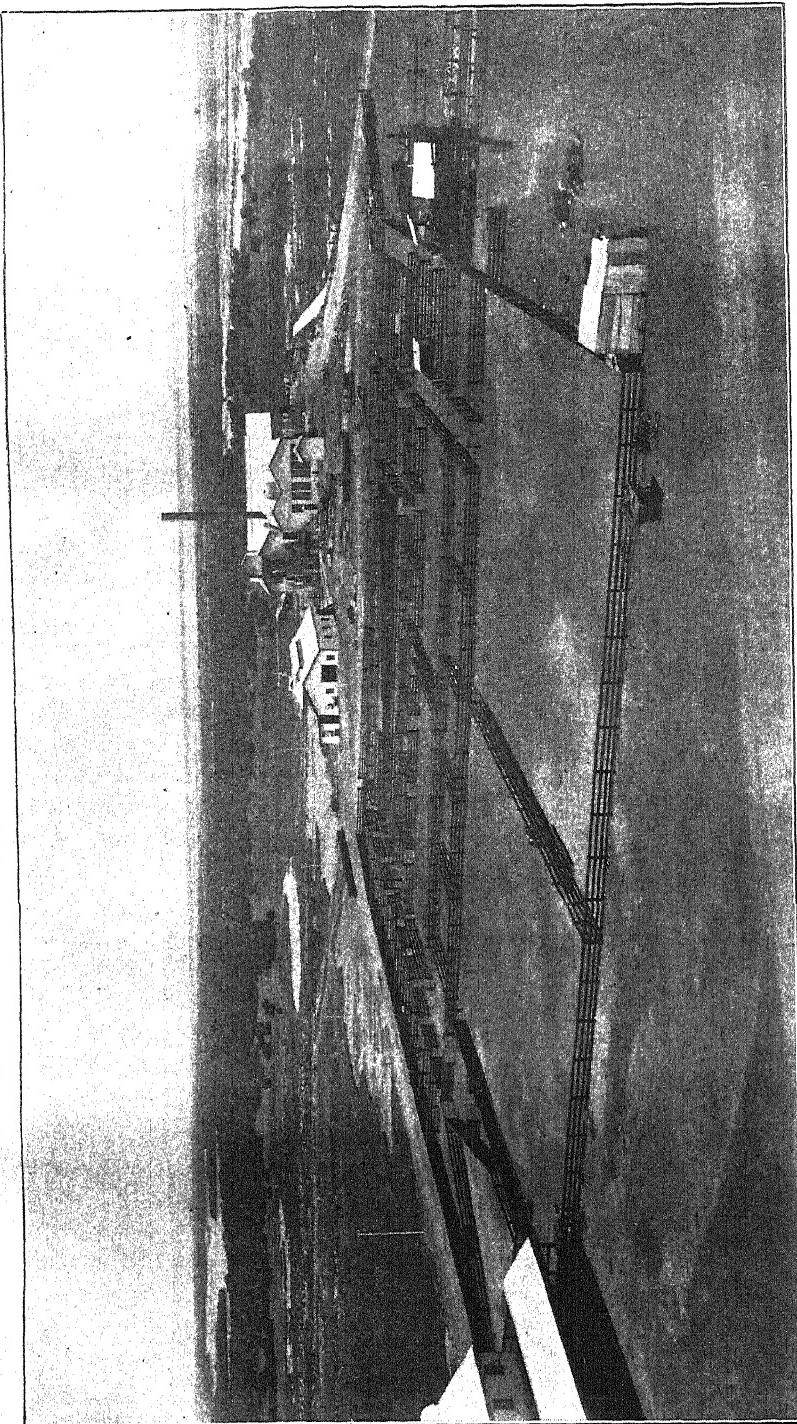
THE PRODUCE EXPORT DEPOT.

Utilising By-Products.

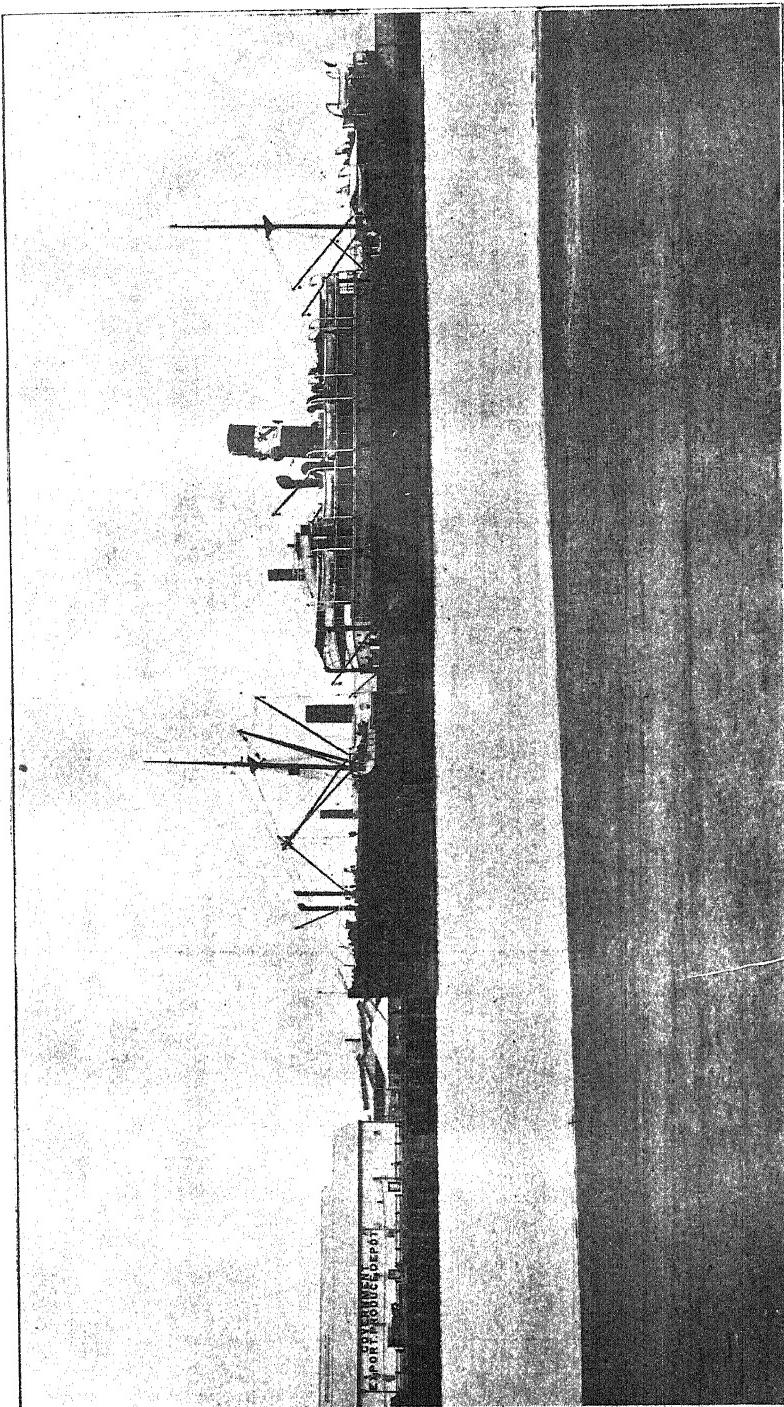
Some important additions have been made to the Produce Export Depot at Port Adelaide since the new buildings were declared open by Lady Le Hunte on September 7th last. The principal additions are the large and very complete works for utilising the by-products of the slaughter-house by converting them into manure, tallow, and poultry meat-meal. These buildings are situated at some distance from the others. A canning plant, adjoining the freezing chambers on the north side, has also been completed; and on the south side the new butter factory is in course of erection. Hitherto the butter factory has been installed in the freezing chambers, but has been found too small to deal with a growing business. The total cost of the Depot, when the latest additions are complete, will be £180,000.

THE TALLOW AND MANURE PLANT

is thoroughly up-to-date. It comprises eight digesters for rendering down the fat and offal from the lambs and sheep slaughtered, three cylindrical cage presses (with a hydraulic press), two of Anderson's steam-jacketed dryers, and an Otis mill and screen. First-quality tallow is obtained from the caul fat, which is cooked by itself. The heads, plucks, and paunches are conveyed to the top floor by means of a lift, and are cooked in the digesters for second tallow and manure. During this process the tallow rises to the surface. Between this and the refuse at the bottom of the vat is the dirty water, which is blown off until the tallow begins to travel through a pipe. The tap is then turned off, and another one leading to the refiners is opened, so that the tallow is blown by steam pressure into the refiners. When all the tallow has been drawn off, the bottom doors of the vat are unscrewed, and the offal, which is to form bone manure, is raked into the centrifugal presses. From these it runs on rails to the press, where all surplus moisture or tallow is squeezed out. The press is opened, and the elevator conveys the manure through the two Anderson dryers. Thence it is spread out overnight to allow the hot steam to escape, and the next morning it is fed over a revolving screen, by which all manure fine enough for drilling purposes is taken out. The rougher material passes over the screen down a chute into a revolving mill, which grinds it up fine enough for the purpose of drilling. From this mill it is conveyed by a worm into the bags, and this completes the manufacture of bone manure.



SLAUGHTER-HOUSE, DRAFTING YARDS, AND TALLOW WORKS.



WHARF AT THE GOVERNMENT DEPOT.

The tallow is left in the refiners until it settles. Steam is turned on, and the whole mass boiled again. At the final settling all dregs remain in the bottom and are drawn off in a liquid state. The tallow is then run into the coolers, and from the coolers to the casks below. Blood is brought across from the slaughter-house in tanks, boiled in the cookers for about 20 minutes, and is then run off into cages, but not pressed, simply passing through the dryer. The drying is a very delicate process; great care has to be exercised or the nitrogen—which is this manure's main quality—is burnt. Twenty-five men and five boys are employed in the works.

A YEAR'S EXPORTATION.

During the year ending June 30th, 1909, the following produce has been exported by the Depot:—189,871 lambs, 50,090 carcasses of mutton, 838 quarters of beef, 18,205 boxes of butter, 62,647 cases of apples, 8,733 cases of pears, 314 cases of grapes, 194 cases of quinces, 50 cases of oranges (total 71,938 cases of fruit), 248 ducklings, 614 chickens, 1,542 cases of honey, 177,112galls. of wine, 349 tons of tallow, 504,240 kidneys. The butter factory received during the year 1,222,074lbs. of cream, which produced 669,344lbs. of butter.



HOMESTEAD ON SHEEP STATION.

SOME INDIGENOUS INSECTIVOROUS BIRDS.

By S. H. CURNOW, Cherry Gardens.

The man in the street has no conception of the vast amount of good that is being done daily in the field, the orchard, and the garden by our indigenous insectivorous birds. Without their assistance in the destruction of the many forms of injurious insects it is questionable whether the tiller of the soil could continue to compete successfully against such overwhelming odds. In favorable seasons certain forms of insectivorous pests, such as moths and beetles, and various kinds of blights and aphides, multiply tremendously, and at once become a serious menace to the producer. Of course, sprays, washes, and poisons are helpful, but it is mostly to the natural enemies of the pests that we must look for salvation. We know only too well that the doctrine of survival of the fittest is true, and it, therefore, behoves us to keep the balance of nature as nearly as possible. Many of our indigenous birds are exclusively insectivorous, and so long as our land is full of birds, so long will insect life be kept in subjection. Encourage the birds in every way to have confidence in you, and to be constantly with you during your labors in the orchard and farm. Many of our birds can be made exceedingly tame through a little kindly consideration.

When digging or hoeing in the garden, toss to them a few pests that have been upturned during your work, such as the grubs of the cockchafer beetle, small beetles, moths, and caterpillars. It is astonishing how quickly they will settle down and make the locality their home. See that they are not unduly disturbed during the nesting period, and that suitable trees and shrubs surround your home and farm for that purpose.

It is greatly to be regretted that so much of our forest land is being denuded of timber, in consequence of which many of our birds are being pushed further afield, and in many districts are unable to nest at all. The imported birds, such as the sparrow and starling, are also culprits in this way, and it is not unusual for them to take sole possession of our old decaying trees and drive useful birds such as the diamond birds and martins away. The hills districts are particularly rich in insectivorous birds, and it would be difficult to give them all even a passing notice in a paper such as this. I will, however, give a brief notice to a few of our more useful types.

WRENS (*Malurus cyaneus*).

This wren is sometimes called *Malurus superbus*, and is known as the blue-backed wren or cocktail. They are ground searchers, and hunt in small flocks. These flocks have certain feeding grounds which are thoroughly canvassed each and many times during the day. They are wonderful foragers, and destroy vast numbers of cockchafer larva, caterpillars, beetles, flies, young grasshoppers, &c.

They nest in September. The nest is dome-shaped, with side entrance, and is placed near the ground. From four to five eggs are laid at a sitting. There are many species of the wren family, no less than 16 being found in Australia.

They are divided into two groups, the red-backs and the blue-backs, and are exceedingly useful birds.

FANTAILS OR FLYCATCHERS (*Rhipidura tricolor*).

This bird is familiar to all, and is, next to the robin, held most in esteem. It is indigenous to a large portion of our island continent, and is a most useful insectivorous bird. The back and throat are jet black, and abdomen pure white; the tail is larger than the wing. Its notes are varied, but always sweet. Its food consists of many kinds of insects, and it is surprising the vast number that it can consume in a day. The nest is cup-shaped, is built of grass, and is tightly bound with spider's web. Four eggs are laid at a sitting, and several broods are raised during the season. It is one of the most trustful of man.

RESTLESS FLYCATCHER (*Sisura inquieta*).

This bird covers a wide area, but is not so plentiful as the fantail, a bird that it much resembles. The back is jet black and the throat and abdomen pure white. The note is a raspy call, and gives it the name of the scissors-grinder. This peculiar note is only made when the bird is in a hovering position over some anticipated tit-bit, and I can only liken it to the noise made by those wooden ratchet-rattles of our boyhood's days. The bird is a friend of the agriculturist and is worthy of his hire. The nest resembles that of the *Rhipidura*, and the clutch of eggs consists of three to four.

BROWN FLYCATCHER (*Microeca fascinans*).

This common little bird is known to all. In color it is brown with white abdomen, and pure white outer tail coverts. It has a habit of sitting on a stump or stone, and watching intently. It has a keen vision, and there is but little in the way of food that escapes it. On capturing a moth or fly, it invariably returns to the same perching-place. It is especially valuable in an orchard, and as a pair usually hunt together, the work is seemingly

well done. It is usually known as "Peter Peter" after its call. The nest is small and open, and is placed about 6ft. from the ground. Two eggs constitute the clutch.

ROBIN (*Petroeca Sp.*).

Probably no bird is so beloved as the robin. Here in Cherry Gardens we have three varieties, all useful birds, and friends that could be ill spared. *Petroeca leggii* has a black head, back, and throat; white forehead, abdomen, shoulder, and base of tail; and bright crimson breast.

Petroeca goodenovii resembles the above, only that the forehead is crimson instead of white. *Petroeca bicolor* is known as the hooded robin, or black-and-white robin. He has a white abdomen, white shoulder, and white base of tail. His head, throat, and back are black. He is a graceful bird and a valued insect hunter. The robins build cup-shaped nests either on a stump or the prong of a tree; it is usually near to the ground, and contains from two to four eggs.

SWALLOWS (*Hirundo Sp.*).

There are several varieties of swallows, all exceedingly useful birds, and all worthy a hearty welcome.

I will here, however, say only a few words on the house swallow, and it is owing to his domesticity that he is selected for special notice. As soon as he returns he will set about putting his house in order, in anticipation of domestic bliss. He will probably select a position in the woodshed or bath-house, in the drawing-room chimney, or under the bridge. Should the position chosen be in or adjacent to an orchard, he and his mate would certainly be worth nearly their weight in gold, for the destruction of moths, etc., would be immense. Several broods of young are raised during the season.

GREY SHRIKE THRUSH (*Collyriocincla harmonica*).

What this bird lacks in gay plumage he makes up in the quality of his song, although I confess I do not think the thrushes of the south are so musically sweet as are they in Wirrabara Forest. There are nine species of shrike thrushes in Australia, but *harmonica* is considered the most useful. He is usually found in the forest lands, and loves the deep humid gullies, and is never far from running water. In color he is grey, the back is umber-brown with grey head and rump. He is a splendid bird to encourage about the home, and makes his nest in the rose-bush or summer-house. The nest is built of bark and contains four eggs. The nest is usually found in a forked tree or the mouth of a hollow stump.

PIPIP OR GROUND LARK (*Anthus australis*).

The ground lark is to be found in almost any stubble paddock, and should be welcomed on any farm or pasture land. It is purely a ground bird, and does much to assist in keeping the insectivorous vermin in check. Several pairs have nested annually in my orchard, and although the nests are a little troublesome when cultivating, they can be dodged with the plough, and the trouble is amply repaid by the splendid scavenging propensities of the birds. The nest is cup-shaped, and is built in a shallow depression in the ground, or beneath an upturned sod or tuft of grass. Three eggs are laid to a clutch. The general appearance of the bird is tawny.

WHITE-BROWED BABBLER OR CAT BIRD (*Pomatorhinus superciliosus*).

We are all familiar with the cat bird, or babbler, and one can never tire watching their fascinating movements. Being quick and energetic they get over the ground in a series of short hops, chatting and talking incessantly. They usually associate in small families of from six to ten, and with wing and tail expanded, seem to pry into every nook and corner that meets their notice. Turning over loose bark, and leaves, and other rubbish upon the ground, there is little that escapes them in the way of insect life. The whole family is full of restless energy, and prove themselves most useful friends in an orchard or garden.

Their power of flight is limited, and when disturbed will usually escape by mounting from limb to limb into some low-growing tree or shrub, and then flying to other undergrowth. These birds usually build several nests before finally settling down to domestic duties. The nest is built of twigs, is dome-shaped with side entrance, and is placed about 8ft. from the ground.

Recently, another species, *P. temporalis*, was voted the most useful insectivorous bird in Victoria, where it is known as the babbler, and also the codlin moth bird. The latter appellation through its partiality to that pest.

YELLOW-RUMPED TIT (*Acanthiza chrysorrhoa*).

There are 10 species of tits peculiar to Australia, and the above is found over the whole continent. They associate in small flocks, and are ground feeders. They are wonderfully destructive to insect life, and the value of this bird in an orchard cannot be over-estimated. They nest annually about my home, and love to suspend their nests in the weeping boughs of the pepper tree and native cherry. It has little fear of man, and is not easily disturbed. They should be encouraged and protected to the uttermost degree. The nest is of the hanging variety with side entrance; it is peculiar in having a cup-shaped nest in the top, in which the male bird sits during the night. Four eggs constitute a clutch.

AGRICULTURAL STATISTICS.

Cereal Harvest of 1908-9.

The agricultural statistics for the year 1908-9 relating to cereals, hay, and fodder have been compiled by Mr. W. L. Johnston, and issued by the Government Statist (Mr. L. H. Sholl). The result of last year's grain operations may be briefly summarised as follows :—

	Area Reaped.	Yield in Bushels.	Bushels per Acre.
Wheat	1,692,131 ..	19,397,672 ..	11·46
Oats	78,494 ..	1,280,235 ..	16·31
Barley	44,911 ..	825,740 ..	18·39

In addition to the areas mentioned above, 348,307 acres of wheat were cut for hay, producing 488,174 tons, or an average of 1·40 ton per acre, as against 271,067 acres in the previous year, from which 315,857 tons of wheat hay were obtained, or an average of 1·17 ton. For oaten hay 68,659 acres were cut, yielding 92,658 tons, or an average of 1·35 ton per acre. In 1907-8 the area of oats mown for hay was 48,151, the yield being 50,753 tons, and the average 1·05 ton.

There is a large increase in wheat production at Pinnaroo, along the Murray, and on the West Coast, due to the opening up of new lands to agriculture. Thus, in the South-Eastern Division the output of 1907-8 was more than doubled during the last harvest (1,334,000bush. against 665,000bush.), and in the Western Division the production rose from 1,667,000bush. of wheat to 2,378,000bush. Barley also shows a satisfactory increase of 258,000bush. compared with the previous year. A large area on Yorke's Peninsula is now devoted to this crop.

The total area under cultivation with cereals for grain, hay, and fodder crops was 2,267,325 acres—an increase of 57,179 acres. The total area is distributed as follows :—Cereals, 1,819,147; hay, 424,924; fodder and fed off, 16,086; peas, &c., 7,168. While the Western and South-Eastern Divisions together show a total increase of 71,154 acres, the increase for the State is only 17,379 acres, due to the falling off in the Northern Divisions. Grazing and dairying in some hundreds have received greater attention.

The areas under barley and oats show increases of 8,162 and 33,413 acres respectively. The area in fallow is 1,097,186 acres, being an increase of 88,453 acres over the preceding year, and increase is pretty evenly distributed all over the State.

The Government Statist adds :—" From the returns collected from mills, farms, and other places of storage, I estimate that 2,000,000bush. of wheat (1907-8 season) were on hand on December 31st, 1908, either in the grain or as flour. Taking this quantity into consideration, and allowing for the current year's home requirements, there should be a surplus of approximately 17,600,000bush., the greater bulk of which has already been exported."

Division and County.	Wheat.					
	Area.			Yield.		
	1906-7.	1907-8.	1908-9.	1906-7.	1907-8.	1908-9.
CENTRAL—						
Adelaide	Acres.	Acres.	Acres.	Bushels.	Bushels.	Bushels.
16,584	14,860	10,199	186,920	180,684	136,185	
Albert	37,824	37,715	40,600	294,135	204,403	352,308
Alfred	21,345	19,742	21,128	216,240	131,679	196,863
Carnarvon	2,252	2,611	1,574	13,425	14,308	11,379
Eyre	74,816	70,378	61,594	491,404	509,329	525,116
Fergusson	129,594	125,947	123,634	549,710	1,593,324	1,527,910
Gawler	102,794	108,612	106,673	1,147,392	1,446,365	1,471,890
Hindmarsh	18,932	19,985	18,137	1,206,387	225,073	220,807
Light	83,645	86,198	79,707	1,091,254	1,639,928	1,265,425
Sturt	63,870	65,480	62,300	531,625	533,552	626,761
Total	551,676	551,528	525,546	5,728,492	6,483,645	6,334,644
Increase	—	—	—	—	—	—
Decrease	—	—	25,982	—	—	149,001
II. LOWER NORTH—						
Burra	23,814	21,715	21,208	191,416	233,798	290,363
Daly	226,497	222,402	208,420	2,673,754	2,723,488	2,562,885
Hamley	—	30	—	—	120	—
Kimberley	20,244	18,465	13,906	131,460	111,506	121,222
Stanley	125,586	128,891	129,554	1,634,274	1,897,888	2,027,675
Victoria	132,893	132,637	117,443	1,828,944	2,307,872	1,737,746
Young	2,130	2,693	2,734	12,145	15,025	20,364
Total	526,164	526,833	493,265	6,471,993	7,289,697	6,760,255
Increase	—	—	—	—	—	—
Decrease	—	—	33,568	—	—	529,442
III. UPPER NORTH—						
Blachford	10,415	9,883	9,625	80,163	71,886	59,720
Dalhousie	123,460	118,018	97,775	1,310,780	1,035,552	966,732
Derby	—	—	—	—	—	—
Frome	114,076	114,739	101,292	1,307,116	1,431,242	1,145,021
Granville	23,196	24,749	18,719	208,513	101,914	78,914
Hanson	21,780	25,079	24,500	135,846	155,057	127,044
Herbert	8,546	8,873	7,293	64,325	50,313	52,032
Lyttton	—	—	—	—	—	—
Newcastle	25,453	29,072	26,427	205,290	183,651	160,400
Total	326,926	330,413	285,631	3,312,033	3,029,615	2,589,863
Increase	—	—	—	—	—	—
Decrease	—	—	44,782	—	—	439,752

Division and County.	Wheat.					
	Area.			Yield.		
	1906-7.	1907-8.	1908-9.	1906-7.	1907-8.	1908-9.
IV. SOUTH-EASTERN—						
Buccleuch	Acres.	Acres.	Acres.	Bushels.	Bushels.	Bushels.
8,732	9,768	18,619	78,485	60,569	151,049	
Buckingham	21,942	20,864	19,951	174,896	189,457	230,236
Cardwell	760	—	1,45	6,750	—	6,060
Chandos	6,360	24,832	55,637	72,312	176,047	674,360
Grey	5,274	5,107	4,351	78,485	86,980	76,043
MacDonnell	3,458	2,917	2,850	35,643	37,338	33,023
Robe	1,706	1,525	1,774	11,848	13,277	22,327
Russell	14,378	15,340	16,701	113,795	101,530	141,605
Total	62,610	80,353	120,928	572,194	665,198	1,334,703
Increase	—	—	40,575	—	—	669,505
Decrease	—	—	—	—	—	—
V. WESTERN—						
Buxton	—	—	—	—	—	—
Dufferin	3,645	3,950	4,665	12,694	15,191	30,880
Flinders	38,514	48,187	54,988	267,184	387,201	480,414
Hopetoun	6,870	6,941	7,120	45,182	41,497	66,842
Jervois	38,153	45,607	56,088	346,178	403,423	673,666
Kintore	17,980	17,729	17,960	114,362	74,487	141,679
Manchester	—	—	50	—	—	700
Musgrave	10,465	10,992	12,828	81,364	98,425	112,220
Robinson	51,235	55,211	54,356	267,950	386,678	422,019
Way	52,136	52,800	58,706	246,875	260,500	449,787
York	—	—	—	—	—	—
Total	218,998	241,367	266,761	1,381,789	1,667,402	2,378,207
Increase	—	—	25,394	—	—	710,805
Decrease	—	—	—	—	—	—
SUMMARY.						
I. CENTRAL	551,676	551,528	525,546	5,728,492	6,483,645	6,334,644
II. LOWER NORTH	526,164	526,833	493,265	6,471,993	7,289,697	6,760,255
III. UPPER NORTH	326,926	330,413	285,631	3,312,033	3,029,615	2,589,863
IV. SOUTH-EASTERN	62,610	80,353	120,928	572,194	665,198	1,334,703
V. WESTERN	218,998	241,367	266,761	1,381,789	1,667,402	2,378,207
GRAND TOTAL	1,686,374	1,730,494	1,692,131	17,466,501	19,135,557	19,397,672
Increase	—	—	—	—	—	262,115
Decrease	—	—	38,363	—	—	—

District and County.	Average Yield of Wheat per Acre.			Rainfall (Approximate Mean).		
	1906-7.	1907-8.	1908-9.	1906.	1907.	1908.
I. CENTRAL—						
Adelaide	Bushels. 11.27	Bushels. 12.16	Bushels. 13.35	Inches. 34.03	Inches. 23.10	Inches. 29.13
Albert	7.02	5.42	8.68	12.66	10.68	13.14
Alfred	10.12	6.67	9.32	11.36	10.22	11.59
Carnarvon	5.96	5.48	7.23	27.09	21.31	19.95
Eyre	6.57	7.24	8.53	14.44	11.74	14.02
Fergusson	11.96	12.65	12.36	20.88	14.85	16.36
Gawler	11.16	13.32	13.80	18.96	14.66	17.39
Hindmarsh	10.90	11.26	12.17	29.63	18.92	22.83
Light	13.05	19.03	15.88	23.22	17.52	19.80
Sturt	8.32	8.22	10.06	19.47	13.67	16.79
Total	10.38	11.76	12.05	21.17	15.67	18.10
Increase ...	—	—	.20	—	—	2.43
Decrease ...	—	—	—	—	5.50	—
II. LOWER NORTH—						
Burra	8.04	10.77	13.69	14.77	11.90	15.51
Daly	11.80	12.25	12.30	16.63	14.16	18.48
Hamley	—	4.00	—	11.36	10.22	11.59
Kimberley	6.49	6.04	8.72	15.93	13.18	15.94
Stanley	13.55	14.72	15.65	20.75	17.36	22.86
Victoria	13.76	17.40	14.80	19.46	18.22	21.52
Young	5.70	5.58	7.45	12.21	10.86	12.11
Total	12.30	13.84	13.71	15.87	13.70	16.86
Increase ...	—	—	—	—	—	3.16
Decrease ...	—	—	.13	—	2.17	—
III. UPPER NORTH—						
Blachford	7.70	7.27	6.20	15.48	13.81	13.64
Dalhousie	10.62	8.77	9.89	15.79	13.82	16.81
Derby	—	—	—	9.78	6.76	8.13
Frome	11.46	12.47	11.30	16.73	15.65	19.48
Granville	8.49	4.12	4.22	14.20	11.37	13.44
Hanson	6.24	6.18	5.19	14.80	12.81	13.74
Herbert	7.53	5.67	7.13	12.81	10.14	11.52
Lytton	—	—	—	10.48	8.32	9.33
Newcastle	8.07	6.32	6.07	15.17	12.55	14.75
Taunton	—	—	—	15.51	11.38	12.50
Total	10.13	9.17	9.07	14.07	11.66	13.33
Increase ...	—	—	—	—	—	1.67
Decrease ...	—	—	.10	—	2.41	—

District and County.	Average Yield of Wheat per Acre.			Rainfall (Approximate Mean).		
	1906-7.	1907-8.	1908-9.	1906.	1907.	1908.
IV. SOUTH-EASTERN—	Bushels.	Bushels.	Bushels.	Inches.	Inches.	Inches.
Buckleuch	8.99	6.20	8.11	19.95	13.96	17.47
Buckingham	7.97	9.08	11.54	22.76	18.80	16.88
Cardwell	8.88	—	5.80	20.41	16.16	17.72
Chandos	11.37	7.09	12.12	16.68	14.68	16.59
Grey	14.88	17.03	17.48	33.02	27.05	28.16
MacDonnell	10.31	12.80	11.59	27.87	20.97	18.97
Robe	6.94	8.71	12.59	31.30	22.29	22.80
Russell	7.91	6.62	8.48	17.25	12.82	15.67
Total	9.14	8.27	11.04	23.66	18.34	19.28
Increase ...	—	—	2.77	—	—	.94
Decrease ...	—	—	—	—	5.32	—
V. WESTERN—						
Buxton	—	—	—	—	—	—
Dufferin	3.48	3.85	6.62	10.32	10.22	11.33
Flinders.....	6.94	8.04	8.74	22.25	17.22	18.16
Hopetoun	6.58	5.98	9.39	10.39	9.00	12.23
Jervois	9.07	8.85	12.01	17.22	12.02	10.17
Kintore	6.36	4.20	7.89	10.95	9.48	11.99
Manchester	—	—	14.00	8.80	8.48	11.68
Musgrave	7.77	8.95	8.75	17.71	14.36	16.35
Robinson	5.23	7.00	7.76	15.87	12.96	13.06
Way.....	4.74	4.93	7.66	14.27	12.74	10.13
York	—	—	—	11.97	10.87	14.46
Total	6.31	6.91	8.92	13.98	11.74	12.96
Increase ...	—	—	2.01	—	—	1.22
Decrease ..	—	—	—	—	2.24	—
SUMMARY.						
I. CENTRAL	10.38	11.76	12.05	21.17	15.67	18.10
II. LOWER NORTH ...	12.30	13.84	13.71	15.87	13.70	16.86
III. UPPER NORTH ...	10.13	9.17	9.07	14.07	11.66	13.33
IV. SOUTH-EASTERN ..	9.14	8.27	11.04	23.66	18.34	19.28
V. WESTERN	6.31	6.91	8.92	13.98	11.74	12.96
GRAND TOTAL...	10.36	11.06	11.46	17.75	14.22	16.11
Increase....	—	—	.40	—	—	1.89
Decrease ...	—	—	—	—	3.53	—

BIRD PESTS.

At the suggestion of the Advisory Board of Agriculture the Minister of Agriculture convened a conference of representatives of official organisations, the members of which are interested in the question of the depredations of birds. The first meeting of the conference was held on June 30th and the second on July 28th, representatives from the Agricultural Department, Advisory Board of Agriculture, Royal Agricultural and Horticultural Society, South Australian Fruitgrowers Association, South Australian Vinegrowers Association, South Australian Ornithological Association, and the Bird Protection Society being present. Mr. G. R. Laffer was elected chairman of the conference, and in opening the proceedings he dealt with the amount of injury done by birds to orchards and vineyards.

Mr. Thos. Hardy, sen., referred to the heavy expense to which vinegrowers were put in frightening and shooting the birds.

Mr. J. W. Mellor gave some interesting notes on the habits of the starling, but deprecated the use of poison on account of the danger to children.

Mr. McIntosh mentioned that, with the flooding of their usual haunts along the Murray, the starlings had become troublesome along the river. They were destroying crops by pulling up the sprouted grain.

Dr. Angove said starlings had been poisoned with strychnine on fruit very successfully in his district, but the danger to human life was too great to permit of this practice being recommended. He advocated the compulsory payment for heads and eggs of both sparrows and starlings.

Captain White supported this, and mentioned that he had observed that when the birds are nesting they look after the young of any that had been destroyed. He had shot 32 birds in one season at one nest; he first shot the female, but next day another had taken her place. The male was then shot and he also was replaced by another male which helped to feed the young of the first pair.

Mr. Summers pointed out that a Bill to extend the provisions of the Sparrow Act to starlings had been drafted, but as the clauses were left permissive instead of compulsory, it would be valueless. The Saddleworth District Council had complained that its efforts to destroy sparrows were nullified by the fact that the neighboring councils did nothing, and this would continue until the Act was made compulsory.

Exception was taken by Mr. Symonds Clark to the compulsory destruction of birds; but a motion moved by Mr. A. E. Pitt, "That the Sparrow Act be amended to include starlings and other destructive birds, and that the provisions be made compulsory throughout the State," was carried by a majority of four votes. Several members thought the Act should only apply

to proclaimed districts, as it was agreed that the starling did an immense amount of good in destroying insects, and that where there were but few orchards or vineyards it could not be called a pest. On the other hand it was pointed out that as starlings travelled 10 to 15 miles daily from their roosting-places, it would be practically useless to attempt to deal with them in one district if they were allowed to breed and increase undisturbed say 10 miles away.

At the meeting held on July 28th the following additional resolutions were carried :—

“ That provision should be made for compulsory payment at uniform rates throughout the State for heads and eggs of noxious birds.”

“ That the rates to be paid be fixed by the Commissioner of Crown Lands, but not to be less than 3d. per dozen.”

“ That payments be made from a fund raised by a general rate in each district and subsidised by the Government.”

“ That Messrs. G. R. Laffer, Dr. Angove, Thos. Hardy, sen., and W. L. Summers be a committee to draft a Bill to give effect to the resolutions of the conference.”

At the July meeting Captain White tabled specimens of South African starlings, some six or eight in all, and stated that these birds were exceedingly destructive to fruit in that country. Owing to the absence of suitable nesting-places the common English starling had not increased in South Australia to anything like the extent it had in the Cape, but South Australia was fortunate in not having such a number of species to deal with.

Mr. J. W. Mellor showed the skulls of a number of sparrows obtained from beneath an owl's nest, also two skeletons of sparrows taken from the crop of a sparrow hawk. He thought a factor in the solution of their troubles was to be found in the total protection of certain native Australian birds that made imported pests their natural enemies. The Delicate owl was something after the style of the English barn owl. It was unfortunately almost extinct on the Adelaide plains, although it was now totally protected. Eight or 10 years ago he had managed to locate a pair of owls at the Reed-beds, and having been afforded every protection for nesting they reared several broods of young, and now there were many pairs of them about the vicinity. Beneath the nesting-place of one he had collected in about six months the skulls of 47 sparrows. At a later period he had gathered another 105 skulls from the one spot; then 120 more. The Delicate owl ate the sparrow, then threw up the skull and other bones. Sometimes there were also the skulls of mice and of a few starlings. Those figures showed the value of the Delicate owl in destroying pests. Another natural enemy of the sparrow was the sparrow hawk—not the kestrel, but a swift-flying species. This bird should also be encouraged. The loss of a few chickens was nothing compared with the good that sparrow hawks did in destroying bird pests.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, July 14th, there being present Messrs. J. W. Sandford, C. J. Valentine, G. R. Laffer, R. J. Needham, C. Willcox, A. M. Dawkins, J. Miller, Geo. Jeffrey, Col. Rowell, and Professors Angus and Perkins.

The Minister advised that he had approved of the reappointment of Col. Rowell, Messrs. A. M. Dawkins, G. Jeffrey, and the President of the South Australian Vinegrowers' Association, and also the Chief Inspector of Stock (Mr. R. J. Needham), as members of the Advisory Board.

Mr. J. W. Sandford was appointed Chairman and Mr. A. M. Dawkins Vice-Chairman for the ensuing year.

Mr. Laffer reported that the Committee appointed at previous meeting had discussed with Mr. Quinn the question of facilitating the work of the orchard inspectors. Under the present Act the inspectors had to report every individual inspection of orchards infested by, say, codlin moth, and get authority from the Hon. Minister before they could insist on ordinary work being done. This meant that often three visits were necessary, and the delay meant that the time when the work should be done was missed. The Committee thought that the Minister should be able to give general authority as to what work should be done in the case of certain insects, and the orchard inspector should then have power on inspection to at once issue the necessary instructions to the occupier. The power to order the destruction of diseased trees should be in the hands of the Chief Inspector only. Mr. Laffer moved that the Hon. Minister be asked to introduce legislation amending the Vine, Fruit, and Vegetable Protection Act in the direction indicated. This was carried unanimously.

The Secretary reported that, in response to suggestions that the Board should take steps to recognise in a suitable manner the valuable services to agriculture rendered by Mr. Molineux, he had consulted the members by letter in respect to endeavoring to secure sufficient funds to establish an "Albert Molineux Scholarship" at Roseworthy College. The members having accorded their support to the proposal, he was communicating with all members of the Agricultural Bureau, seeking subscriptions. Mr. C. J. Tuckwell, of Wilmington, had promised £10 to the fund. Mr. Miller said he thought it would have been better to have asked the concurrence of the Branches before taking definite action. The Secretary pointed out that this would have involved a delay of two months, and it was desired that the matter should be placed before the members of the Bureau at once. Mr. Valentine moved that the Secretary's action be approved. He thought that prompt action was necessary, and believed that the Branches would heartily support the proposal. There were many persons not connected with the Bureau who would be glad

to help. Mr. Dawkins supported. What had particularly impressed him in connection with Mr. Molineux's work was its unselfishness. If he thought a thing was right he did not consider what effect its advocacy might have upon himself. He was from the first a strong supporter of Roseworthy College, and did his best to popularise it when most people were inclined to sneer at scientific agriculture. Mr. Laffer said he thought many fruitgrowers were probably unaware of the work done by Mr. Molineux in connection with the treatment of insect and fungus diseases. He was the first to advocate spraying with Bordeaux mixture in this State, and also spraying with arsenicals for codlin moth. He hoped that fruitgrowers would contribute liberally to the scholarship fund. The motion was carried unanimously.

Approval to the formation of new Branches of the Agricultural Bureau was given as under :—Geranium—with the following gentlemen as members :—Messrs. P. O'Loughlin, J. Cochrane, M. Alford, W. Mitchell, D. Leahy, C. Weidenhofer, A. A. Cooney, M. J. Cooney, J. J. Watkins, W. Watkins, E. Wendelborn, R. Sheridan, A. Gurr, W. D. Hammond, F. J. Hammond, W. H. Foreman, F. Foreman, E. C. Alford, and F. S. Alford. Keith—with the following gentlemen as members :—Messrs. J. B. Maken, S. Crouch, H. Matt, G. Witmitz, — Schulz, W. A. Crouch, — Marcombe, E. Crouch, W. Davis, P. Draper, W. Fulwood, and J. A. Lock. Parrakie—with the following gentlemen as members :—Messrs. A. Beelitz, G. Schmidt, A. Cooney, D. Bull, C. Morrison, H. Wittwer, J. McGuire, T. J. Dayman, J. Ferme, J. Willis, A. J. Dayman, J. Burton, H. Diener, F. Gravestock.

The formation of a Branch at Ffeeling was also approved.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. H. Hornhardt, J. R. Hill, F. M. Beaty, J. and M. Abrook, and C. L. Venning, Utera Plains ; R. Fairbank, Miltalie ; J. Wilson and H. Richards, Dawson ; S. Gibbs and W. G. Jenner, Coonalpyn ; H. H. Lindo, P. Neylon, and D. Finch, Cradock ; F. Cleve and H. Trewin, Redhill ; A. D. Mould, Uraidla ; J. H. Doecke, Sutherlands ; W. H. Allen, Forest Range ; H. R. H. Mattinson, Tatiara ; E. A. Hodges and Rev. R. J. Rose, Kadina ; R. Kutzer, Clarendon ; F. Sutton, Nantawarra ; J. Barton, sen., Port Elliot ; S. Stone, D. Turner, and L. Dahlenberg, Port Germein ; G. Scott, Kybybolite ; W. Heard and W. N. Crawford, Wilmington ; J. Kulmar, Penong ; L. Burnett, E. Nieksch, and J. P. Trezona, Sherlock ; J. Woolard, Gumeracha ; T. Dunsford, J. and S. Sandow, Narridy ; H. Moss, Whyte Yarcowie ; R. Storr, B. Donnelly, Port Broughton ; C. B. Hasting, Maitland ; A. Woolford, Beetaloo Valley ; H. Miller and F. Pryor, Clare ; E. W. Radford, Carrieton ; C. Inkster and J. Shepherd, Colton ; W. Curnow, J. Rundle, and R. Cowan, Paskeville ; H. Schmidt, T. J. L. Fitzgerald, and Parke Irons, Shannon ; J. Burton, W. S. Carmichael, and W. Abell, jun., Crystal Brook.

Mr. Jeffrey referred to the resignation of the Wool Expert, Mr. W. J. Mathews, who had received an important appointment in Sydney. It was

resolved that the Board place on record their appreciation of the good work done by Mr. Mathews and regret that the State was losing his services.

Professor Perkins said he had been requested to undertake experiments to determine the amount of spirit obtainable from raisins. In view of the fact that ordinary raisins had been produced in excess of Commonwealth requirements, considerable quantities had been exported at low rates; but the Renmark growers were anxious to know whether the surplus could not be more profitably utilised for the manufacture of grape spirit. Experiments he had carried out showed that the raisins contained from £30 to £34 worth of spirit per ton, and when allowance was made for cost of extraction and the profit of the makers the raisins should be worth £18 to £20. Col. Rowell said the matter was of considerable importance to the settlers on the Murray. It would be a fine thing if all the second-grade raisins could be profitably utilised for spirits, leaving only the higher grades for marketing.

The Secretary reported that six entries had been received for the trial of stone-gathering machines to be held at Paskeville about the end of August.

Col. Rowell called attention to statements that stallions that were refused certificates of soundness in Victoria were being sent to South Australia. Purchasers of imported stallions should insist on certificates of soundness. The Royal Agricultural Society was desirous of stopping the practice of allowing unsound horses to be exhibited, but he regretted they did not receive more support in this matter. Professor Angus said he had been positively assured that rejected stallions were being sent from Victoria to South Australia. It was safe to assume that any Victorian-bred stallion not mentioned in the report of the Victorian Veterinary Department as having passed the examination was unsound, and buyers should insist on production of certificates with all imported horses. It was resolved that the attention of the Hon. Minister be called to resolution passed in August, 1908, urging that legislation should be introduced to provide for the veterinary examination of all stallions whose services shall be offered for hire.



USE OF FERTILISERS IN SOUTH AUSTRALIA.

By W. L. SUMMERS.

During the past season there has been a remarkably strong demand for fertilisers for the cereal crops of South Australia. From returns received from the manufacturers and importers I estimate that during the 12 months ending June 30th, 1909, something like 80,000 tons of fertiliser have been sold in this State. Of this total probably 3,500 tons is used for market gardens, vineyards, orchards, green crops, and grass lands, leaving a total of 76,500 tons used for the 1909-10 cereal crops.

Of the total output the chief item is mineral super., of which two grades are sold, viz., 36 to 38 per cent. water-soluble phosphate (standard grade) and 30 to 32 per cent. water-soluble phosphate. Approximately the total is made up as under :—

	Tons.
Mineral superphosphate	65,000
Neutral supers. and mixtures with mineral super. as the base	12,500
Bonedust and guano	2,500
Total	80,000

In previous years we have calculated the quantity of manure per acre used on the average on our cereal crops at 100lbs. to 112lbs. per acre. The amount has been coming down of late years owing to the large areas of land in our drier districts which have been coming into cultivation, and where the quantity of manure used seldom exceeds 60lbs. per acre. Last year for the first time the Statistical Department collected figures showing areas of land manured and quantities of manure used. According to these figures the average quantity of manure used is 86lbs. per acre ; this, however, includes market gardens, orchards, and vineyards, where from 5ewts. to 20cwts. per acre are used. Based on these figures, I am of opinion that it is within the mark to say that the average used for cereal crops does not exceed 80lbs. per acre.

Taking 80lbs. as the basis of calculation the area of the 1909 cereal crop manured with commercial fertilisers may be set down at 2,100,000 acres. The total increase in the output of manure for the year is 11,500 tons.

In connection with the purchase of fertilisers I wish to urge upon buyers the necessity for exercising some care before ordering any new brands. This is especially the case in regard to guano ; small lots of very inferior guano are from time to time placed on the market. These usually have not been registered in accordance with the law, and the Department is not, therefore, able to exercise any check upon their quality. It does not seem to be generally known that any person can, on application to the Department, obtain particulars concerning all brands of fertilisers on the market. If this right were availed of there would be little chance of fraud.

ROSEWORTHY AGRICULTURAL COLLEGE.

THIRD REPORT ON THE PERMANENT EXPERIMENT FIELD SEASONS 1907-8 AND 1908-9.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College, and
W. J. SPAFFORD, Assistant Experimentalist.

(Continued from p. 1015 July issue.)

FIFTH SERIES.—BARE FALLOW, WHEAT, AND PASTURE.

In this Fifth Series it has been our endeavor to illustrate the following type of Rotation :—

1. Bare Fallow.
2. Wheat.
3. Pasture.

This is a form of Rotation that is frequently met with to the North of Adelaide, and a careful record of the results that concern it should render possible a general comparison with the more common practice of making Wheat alternate regularly with Bare Fallow.

General experience on the College Farm tends to prove that heavy dressings of Superphosphate applied to the Cereal Crops have had the effect of increasing very considerably the Stock-carrying capacity of any field temporarily left out of cultivation. Thus the carrying capacity of the more recently purchased fields is very far from equalling that of the fields of the old College Farm, which for close on a quarter of a century have been more or less heavily dressed with Phosphates. It was thought that the Plots of this Fifth Series might be so arranged as to throw into relief this important after effect of Phosphatic Manures. Hence, instead of merely allotting three Plots to this Series, as would otherwise have been the case, 24 plots have been assigned to it, gathered together into four separate Groups. In the First Group each Wheat Crop receives a regular dressing of $\frac{1}{2}$ cwt. of Superphosphate to the acre ; in the Second Group 1cwt. to the acre ; in the Third Group 2cwts. to the acre ; and in the Fourth Group 3cwts. to the acre.

It is doubtful, however, whether results hitherto collected in this direction can have the value that must attach to those of future years. The position

is that the Permanent Experiment Field forms part of the Old Farm, and that as such every portion of it has in the past been repeatedly and heavily dressed with Phosphates, and that for some years to come the effects of these earlier dressings must continue to make themselves felt in the Plots that have been lightly dressed only since 1904. It must be evident that in this direction striking and convincing results could be secured only on land that had not come under the disturbing influence of earlier manuring. And as a small farm has this season been added to the College property, we propose reserving on it a suitable area for experimental work in this direction.

Finally the Plots of this Fifth Series serve to measure the effect of heavy and light dressings of Superphosphate on the Wheat Crop itself.

What has reference to the Rotation Plots of the Fifth Series may therefore be dealt with under the following headings :—

I. Wheat after Pasture and Bare Fallow compared with Wheat after Bare Fallow alone.

II. Effects on Pasture of Heavy and Light dressings of Phosphates applied originally to the Wheat Crop.

III. Effects on the Wheat Crop of Heavy and Light dressings of Superphosphate.

I.—WHEAT AFTER PASTURE AND BARE FALLOW COMPARED WITH WHEAT AFTER BARE FALLOW ALONE.

Under this heading we must confine our comparisons to Plots Nos. 10 and 11 on the one hand and Plots Nos. 17, 18, and 19 on the other, in either of which case the Wheat Crop received a yearly dressing of 1cwt. of Superphosphate to the acre.

In this direction we are as yet able to avail ourselves of the results of one season only, viz., 1908-09; for it was not until this season that a Wheat Crop was raised in the Plots of the Fifth Series with both Pasture and Bare Fallow immediately preceding it.

Plot No. 19 was under Wheat, dressed with 1cwt. of Superphosphate, in 1908; it had been treated as Bare Fallow in 1907, and as Pasture in 1906; in 1905 it carried a Wheat Crop.

Similarly, in the Third Series, Plot No. 10 was under Wheat, dressed with 1cwt. of Superphosphate, in 1908; it was treated as Bare Fallow in 1907; was under Wheat in 1906; and treated as Bare Fallow in 1905.

Results secured in 1908 for either Plot are shown below in Table VII.

TABLE VII.—*Showing 1908 results from Wheat after Pasture and Bare Fallow comparatively with Wheat after Bare Fallow alone.*

	Plot 19. Wheat after Pasture and Bare Fallow. Per Acre.	Plot 10. Wheat after Bare Fallow Alone. Per Acre.
Total Produce	2 tons 11cwt. 55lbs.	2 tons 11cwt. 26lbs.
Grain	29bush. 2lbs.	32bush. 47lbs.
Straw and Chaff to 60lbs. of Grain	139lbs.	115lbs.
Weight of Bushel of Grain	63½lbs.	64½lbs.

It will be noted that, so far as a single season is concerned, the results appear to be in favor of the Plot in which a year's pasture did not interrupt the regular succession of Wheat and Bare Fallow. Whether this will continue to be the case over a number of years it rests with future seasons to show.

We are in a position to establish roughly what has hitherto proved to be the grazing value of the land in the years that it has been depastured. We shall show under another heading that for three years the average yearly grazing value of land sown to Wheat dressed with 1cwt. of Superphosphate to the acre, when out of cultivation, has been represented by 2·46 sheep per acre per annum, whilst in 1908, from the record of weights kept, we found that the average increase in live weight per acre secured by a Flock of Sheep on these Plots was represented by 245lbs. for the year, or, roughly, the weight of two and a half average-size Merino wethers.

When comparing Wheat after Pasture and Bare Fallow with Wheat after Bare Fallow alone, we have to take into consideration the fact that in a period of six years the latter form of Rotation will yield three Wheat Crops against two Wheat Crops yielded by the former. And where Pasture intervenes in the Rotation we have, in the same period of time, two years of Pasture to set off against the additional Wheat Crop of the Rotation of Wheat and Bare Fallow alone. Hence if, in the absence of any others, we adopt for the time being the figures given in the preceding paragraph, we have to set against the additional Wheat Crop the profits derivable from the keep of Five Sheep to the acre ; or, from another aspect, the manufacture in two years of 490lbs. live weight of mutton and wool. As yet, however, our records in this direction are far too meagre to permit of any more detailed discussion of this aspect of the question.

II.—EFFECTS ON PASTURE OF HEAVY AND OF LIGHT DRESSINGS OF PHOSPHATES APPLIED ORIGINALLY TO THE WHEAT CROP.

That in this direction we are not yet in a position to point to results that are altogether conclusive and convincing has already been indicated. We summarise below in tabular form what results bearing on this aspect of the question are available for the years 1906, 1907, and 1908,

TABLE VIII.—*Showing Grazing results on Pasture after Wheat dressed with $\frac{1}{2}$ cwt. of Superphosphate to the acre.*

Years.	Period Grazed.	Number of Days actually Grazed.	Sheep per Acre for Days actually Grazed.	Equivalent of Sheep Grazed for 365 Days.
GRAZING FOR YEAR WHEN UNDER PASTURE.				
1906.....	July 31 to January 3	96	8.26	2.17
1907.....	June 11 to October 29	120	7.27	2.39
1908.....	August 3 to November 25	110	5.50	1.66
Mean	—	108	6.96	2.07
WINTER GRAZING IMMEDIATELY BEFORE FALLOWING.				
1907.....	April 27 to July 24	36	12.99	1.28
1908.....	June 22 to 29	8	9.13	0.20
Mean	—	22	12.28	0.74
STUBBLE GRAZING AFTER REMOVAL OF CROP.				
1909.....	January 27 to March 10	43	8.64	1.02
AGGREGATE GRAZING OVER THREE YEARS' ROTATION.				
Pasture Year		108	6.96	2.07
Bare Fallow Year		22	12.28	0.74
Crop Year		43	8.64	1.02
Aggregate Value of Grazing in three years' Rotation				3.83

TABLE IX.—*Showing Grazing results on Pasture after Wheat dressed with 1cwt. of Superphosphate to the acre.*

Years.	Period Grazed.	Number of Days actually Grazed.	Sheep per Acre for Days actually Grazed.	Equivalent of Sheep Grazed for 365 Days per acre.
GRAZING FOR YEAR WHEN UNDER PASTURE.				
1906.....	August 21 to January 18	90	10.36	2.55
1907.....	June 11 to October 29	122	6.67	2.23
1908.....	August 3 to January 15	161	5.85	2.58
Mean	—	124	7.23	2.46
WINTER GRAZING IMMEDIATELY BEFORE FALLOWING.				
1907.....	May 24 to August 1	33	10.31	0.93
1908.....	June 22 to 29	8	10.14	0.22
Mean	—	21	10.27	0.58
STUBBLE GRAZING AFTER REMOVAL OF CROP.				
1909.....	January 15 to March 10	55	5.59	0.84
AGGREGATE GRAZING OVER THREE YEARS' ROTATION.				
Pasture Year		124	7.23	2.46
Bare Fallow Year		21	10.27	0.58
Crop Year		55	5.59	0.84
Aggregate Value of Grazing in Three Years' Rotation,				3.88

TABLE X.—*Showing Grazing results on Pasture after Wheat dressed with 2cwt.s. of Superphosphate to the acre.*

Years.	Period Grazed.	Number of Days actually Grazed.	Sheep per Acre for Days actually Grazed.	Equivalent of Sheep Grazed for 365 Days per acre.
GRAZING FOR YEAR WHEN UNDER PASTURE.				
1906.....	August 21 to November 13 ...	71	10.18	1.98
1907.....	June 11 to October 29.....	117	6.62	2.12
1908.....	August 3 to January 15	151	6.49	2.68
Mean	—	113	7.31	2.26
WINTER GRAZING IMMEDIATELY BEFORE FALLOWING.				
1907.....	May 4 to July 29	41	12.38	1.39
1908.....	June 11 to 22	12	9.14	0.30
Mean	—	26	11.89	0.84
STUBBLE GRAZING AFTER REMOVAL OF CROP.				
1909.....	January 15 to March 10	55	5.05	0.76
AGGREGATE GRAZING FOR THREE YEARS' ROTATION.				
Pasture Year		113	7.31	2.26
Bare Fallow Year		26	11.89	0.84
Crop Year		55	5.05	0.76
Aggregate Value of Grazing in Three Years' Rotation				3.86

TABLE XI.—*Showing Grazing results on Pasture after Wheat dressed with 3cwt.s. of Superphosphate to the acre.*

Years.	Period Grazed.	Number of Days actually Grazed.	Sheep per Acre for Days actually Grazed.	Equivalent of Sheep Grazed for 365 Days per acre.
GRAZING FOR YEAR WHEN UNDER PASTURE.				
1906.....	September 16 to November 13..	52	23.71	3.38
1907.....	June 11 to October 29.....	103	6.51	1.84
1908.....	August 3 to January 15	161	5.75	2.54
Mean	—	105	8.99	2.58
WINTER GRAZING IMMEDIATELY BEFORE FALLOWING.				
1907.....	May 13 to July 31	35	10.24	0.98
1908.....	June 11 to 22	12	10.67	0.35
Mean	—	23	10.58	0.67
STUBBLE GRAZING AFTER REMOVAL OF CROP.				
1909.....	January 15 to March 10	55	4.55	0.69
AGGREGATE GRAZING OVER THREE YEARS' ROTATION.				
Pasture Year		105	8.99	2.58
Bare Fallow Year		23	10.58	0.67
Crop Year		55	4.55	0.69
Aggregate Value of Grazing in Three Years' Rotation				3.94

The results set out in these four Tables do not call for lengthy comment ; for to a very large extent they are self-explanatory. To a few points, however, we wish to draw attention. In the first place, it will be noted that the difference between the grazing value of the several Plots is not very great ; but at the same time, such as it is, this difference is generally in favor of those Plots that were manured most heavily. As has already been pointed out, this similarity in results must probably be attributed to the residual influence of heavier dressings of past years persisting in those Plots that have been lightly dressed since 1904. It should be added that to the eye the feed carried by the more heavily dressed of the Plots has always appeared to be much the best. We anticipate that in years to come, as the influence of past manuring begins to wear off, the difference in results will be far more pronounced.

It will be noted that what grazing was availed of in these Plots has been referred to under three different headings, each of which corresponds to a separate year in the rotation. In these calculations we have adopted, not the calendar year, but the agricultural year, opening in April and closing in March. Thus "pasture grazing" as here understood refers strictly to the grazing available between the month of April immediately following Harvest and the end of March of the following year, and immediately preceding fallowing operations. In this Fifth Series it is of course with this type of grazing that we are mainly concerned ; for both Stubble Grazing and what grazing can be secured in the short period that immediately precedes fallowing operations are present to an equal degree when Wheat follows Bare Fallow in regular succession.

The three years under review well illustrate how precarious is the position of those who in the early winter months depend exclusively for the upkeep of their Flocks and Herds on the growth of natural pasture. Thus, whilst in 1907 feed was available and Pasture Plots were accordingly fed down from the beginning of June, this was not, however, possible until August in both 1906 and 1908. It is of course perfectly true that in either year it would have been possible to feed these Plots earlier in the season, if it had been imperative that this be done ; nevertheless the class of feed they would have supplied could hardly have led to the production of prime early Lambs or an abundant flow of milk.

Until 1908 the pasture on these Plots was represented by what herbage sprang up spontaneously on the stubbles of the preceding Wheat crop, and consisted for the most part of Wheat shaken out at harvest time, native clovers, Cape marigold, barley grass, geranium, &c. Experience, however, soon proved that under this arrangement Plots appeared to be favored in proportion to the quantity of grain that happened to shake out at harvest

time, a factor altogether accidental and fluctuating in its incidence. With a view therefore to equalising matters in this direction, we decided to sow the Pasture areas in autumn to a Forage Catch Crop, and in 1908 Black Vetches were selected for the purpose. They were sown from the 4th to the 6th of April at the rate of 20lbs. of seed to the acre. They were not touched until August 3rd, and were practically fed out by November. Subsequently to this date the balance of the feed available on these Plots was represented by spontaneously grown indigenous or acclimatised plants. On the whole we were not altogether impressed with the results secured with the Vetches; within a certain measure, however, their only relative success must be attributed to the altogether unusual lateness of the season.

It will be noted that in summary the average feeding value of the Pasture Year was represented for three years by the following figures:—

$\frac{1}{2}$ cwt.	Plots carried the equivalent of 2.07 Sheep per acre per annum				
1cwt.	"	"	2.46	"	"
2cwt.	"	"	2.26	"	"
3cwt.	"	"	2.58	"	"

In addition to the above, both Stubble-grazing and grazing before fallowing was availed of, although in different years. Winter grazing that immediately precedes Fallowing operations is not as a rule of much importance, except in those years in which early autumn rains bring on very early feed. Stubble-grazing, on the other hand, has a value that does not appear always to be sufficiently appreciated, as a glance at the adjoining Tables will serve to show.

Finally, if we group together the various forms of grazing available over the three years of the Rotation, we find for the several Plots the following results:—

$\frac{1}{2}$ cwt.	Plots carried the equivalent of 3.83 sheep for three years per acre				
1cwt.	"	"	3.88	"	"
2cwt.	"	"	3.86	"	"
3cwt.	"	"	3.94	"	"

We had hoped to be in a position to give full data as to the weights, and increases in weight, of the Sheep depastured on these Plots; and had indeed kept data for the purpose for both 1907 and 1908. Unfortunately, on looking over these data, we have discovered several unavoidable inaccuracies which deprive them of all their value, and we have felt compelled to give up any consideration of them. We trust in future Reports to be in a position to do full justice to this important question.

III.—EFFECTS ON THE WHEAT CROP OF HEAVY AND LIGHT DRESSINGS
OF SUPERPHOSPHATE RESPECTIVELY.

Whether the application of heavy dressings of Superphosphate to the Wheat Crop are at all directly remunerative is a question that has frequently been discussed. What results we have secured on the subject in the Permanent Experiment Field are summarised below in Table XII.

TABLE XII.—*Showing Summary of Crop Returns from Plots dressed with varying quantities of Superphosphate from 1905 to 1908.*

Years.	Plots.	Total Produce per Acre.		Grain per Acre.	Straw to 60lb. of Grain.	Weight of Bushel.
		Tons	cwts.			
$\frac{1}{2}$ CWT.-PLOTS.						
1905	16	2	14	88	28 53	152
1906	15	2	6	3	19 14	208
1907	14	1	3	21	16 24	98
1908	16	2	7	50	27 34	133
Mean.	—	2	2	97	23 1	148
1CWT.-PLOTS.						
1905	19	2	17	4	29 19	158
1906	18	1	17	46	17 46	178
1907	17	1	0	27	14 22	98
1908	19	2	11	55	29 2	139
Mean.	—	2	1	61	22 37	143
2CWT.-PLOTS.						
1905	22	2	15	22	30 51	140
1906	21	2	2	7	20 4	175
1907	20	0	19	77	13 21	105
1908	22	2	12	71	31 26	128
Mean.	—	2	2	44	23 55 $\frac{1}{2}$	137
3CWT.-PLOTS.						
1905	25	2	18	104	28 52	160
1906	24	2	4	18	22 57	155
1907	23	0	18	12	12 5	108
1908	25	2	14	74	32 54	126
Mean.	—	2	3	108	24 12	139
						62-13

Thus, as a matter of experience extending over four seasons, we must conclude that the increase in yield, either in the form of Grain or Hay, following as the result of the use of heavy dressings of Superphosphate as compared with light ones, is practically negligible *in the present state of fertility of the soil of the Permanent Experiment Field*. It is very essential that this point be borne in mind, for in less favorable conditions it will be realised how different the results might be. When, in 1906, the First Report on these Plots was issued, it was pointed out that the experimental work was being started in a field possessed of a high degree of acquired fertility. This view

was borne out by the behaviour of the No-Manure Plots, of which in 1905 there were six with a general average of close on 21 bush. to the acre. That this acquired fertility has not yet been exhausted is well illustrated by the yields of Plots Nos. 26 and 27, under Bare Fallow and Wheat without Manure alternately ever since 1904. These yields are shown below:—

1905	Plot No. 27,	Wheat without Manure,	25 bush.	18 lbs.	
1906	" 26	"	18 bush.	18 lbs.	—
1907	" 27	"	15 bush.	22 lbs.	
1908	" 26	"	25 bush.	5 lbs.	

The 1908 yield of No-Manure Plot No. 26 (the second crop carried by it without Manure since 1905) shows very clearly that there is not as yet any apparent falling off in the acquired fertility of the field.

In 1907 we had the curious experience of finding the yields exactly in inverse ratio of the quantities of Superphosphate used. It is not easy to account for results so unexpected, particularly as there was no blighting off of the crops, as in 1906; we are inclined to attribute them to some defect in the tillage conditions of the Plots that had escaped our notice at the time.

In 1908, whilst there was comparatively little difference in the Total Produce yields of the several Plots, the Grain yields were consistently heavier on the more heavily dressed of the Plots, indeed sufficiently so to leave a good profit per acre at ruling rates for the heavier dressings of Superphosphate used, as is shown by figures of Table XIII.

TABLE XIII.—*Showing Net Profits derived in 1908 from use of Heavy dressings of Superphosphate on Wheat Crop.*

		Yields.	Excess in Yield over $\frac{1}{2}$ cwt. Plot.		Value of Excess at 3s. 9d. a bushel.	Extra Cost of Manure at 4s. 4d. a cwt.	Net Profit Per Acre.
			bush. lbs.	bush. lbs.			
$\frac{1}{2}$ cwt.	.. Plot 16	27 34					
1cwt.	.. Plot 19	29 2	1 28	0 5 6	2 2	3 4	
2cwts.	.. Plot 22	31 26	3 52	0 14 6	6 6	8 0	
3cwts.	.. Plot 25	32 54	5 20	1 0 0	10 10	9 2	

It is right to point out that this is the first season that the effect of the heavy dressings has become cumulative; thus Plot 25, dressed with 3cwts. of Superphosphate to the acre in 1908, was similarly treated in 1905, and had the additional advantage of carrying a large number of sheep to the acre in 1906. We anticipate that in years to come these advantages will be even more pronounced in their effects on the Wheat crop.

The fear has sometimes been expressed that heavy dressings of Superphosphate might lead to the blighting off of crops, as is sometimes the case

with heavy dressings of Farmyard Manure. We have already in earlier Reports pointed out that such has never been our experience, and we take the opportunity of confirming the view formerly expressed by us that if crops are apt at times to blight off as a consequence of soft, sappy growth and unfavorable weather conditions, Phosphatic Manures cannot in any way be looked upon as contributing to accidents of this sort. The main cause in our opinion is an over-abundance in the soil of nitrates, formed in the course of a moist autumn and mild winter. And in our experience, when such is the case, all types of crops are liable to be blighted off, whether they have been heavily or lightly dressed with Superphosphates.

MANURE PLOTS.—FIRST SERIES—NITRATES APPLIED TO WHEAT AFTER BARE FALLOW.

The paramount importance of Nitrogenous Manures to the world generally is too well known to need emphasizing here; for within recent times has not a prominent Chemist shown some inclination to associate the approaching exhaustion of the Chili Saltpetre beds with something akin to general starvation? Indeed, to the farmer of cold humid regions, these Manures have all the importance of Phosphatic Manures under our warmer and drier climate. Nevertheless these Nitrogenous Manures have as yet made no impression on local practice; nor is this likely to have been so, because of the lack of early advocates. It is more than probable that formerly the influence of European experience must have led to more frequent recommendation of Nitrogenous Manures than that of any other type of Manure. On the other hand, the readiness, nay the eagerness, with which South Australian farmers adopted Superphosphates is almost proof sufficient that the complete neglect of Nitrogenous Manures points to the fact that in present circumstances there is no particular call for them. And yet in the Wheat plant grown under our conditions there is quite as much Nitrogen accumulated as in the Wheat plant reared under colder and more humid conditions.

It seems probable, therefore, that one of the principal reasons that has hitherto rendered unnecessary in ordinary practice the general use of Nitrates is the almost universal adoption of Bare Fallow before a Cereal crop. It is not that our soils are in any way abnormally rich in Total Nitrogen, very far from so; there are few of them, indeed, that more than exceed what from an European standpoint would be considered only average richness. On the other hand, a year's well-worked Bare Fallow offers, under our mild conditions of climate, exceptional opportunities to the active Nitrification of what organic matter may be present, and perhaps too to the direct absorption of atmospheric Nitrogen by other associated Bacteria. With us it is probable that Nitrification is most active in the Spring and early Summer months, and in the days that immediately follow the fall of the first autumn rains,

whilst in the hottest months of the summer only it undergoes temporary suspension. Thus our Cereal crops sown on well-worked fallow land find the latter well stocked with Nitrates, which our relatively light rains have had no power to leach away beyond the reach of their roots. These facts may perhaps serve to account for the lack of success that it is customary to attribute to Nitrogenous Manures in South Australia. It was with a view of establishing these facts by definite and consecutive experiments that the Plots of the Series were established in the Permanent Experiment Field. With general reference to them it should be recollected that a direct increase, however small, attributable to the use of Nitrogenous Manures, must always be of interest, even if in present market conditions it do not prove directly remunerative. A time may yet come when an increase in the value of corn or a decrease in the cost of Nitrogenous Manures may lend value to whatever improvement in yield may be realised.

We append below, in Table XIV., the data collected concerning this Series of Plots over the past four seasons :—

TABLE XIV.—*Showing 1905-08 returns from Manure Plots—First Series.*

Years.	Plots.	Total Produce Per Acre.	Grain Per Acre.	Straw to 60lbs of Grain.	Weight of Bushel. lbs.	Weight of Bushel. lbs.
NO-MANURE PLOTS.						
1905	27	2 1 37	25 18	123	63	
1906	26	1 11 58	18 18	160	61 $\frac{1}{4}$	
1907	27	1 0 102	15 52	88	63 $\frac{1}{2}$	
1908	26	1 11 19	25 5	79	64 $\frac{1}{4}$	
Mean.	—	1 11 26	21 8	113	63	
2CWT. SUPERPHOSPHATE PLOTS.						
1905	29	3 3 107	32 12	162	63	
1906	28	2 1 108	20 48	164	58 $\frac{3}{4}$	
1907	29	1 7 108	20 48	91	63 $\frac{1}{4}$	
1908	28	2 9 58	29 29	128	64	
Mean.	—	2 5 95	25 49	136	62 $\frac{1}{4}$	
2CWTS. SUPERPHOSPHATE WITH 1CWT. NITRATE OF SODA APPLIED AT SEEDTIME.						
1905	31	3 4 107	36 1	142	62	
1906	30	2 3 44	22 27	157	58	
1907	31	1 8 95	20 29	98	63	
1908	30	2 15 8	33 27	124	64	
Mean.	—	2 8 8	28 6	130	61 $\frac{3}{4}$	
2CWTS. SUPERPHOSPHATE WITH 1CWT. NITRATE OF SODA APPLIED IN SPRING.						
1905	33	2 19 62	34 26	134	63 $\frac{1}{2}$	
1906	32	2 5 14	23 32	155	58	
1907	33	1 5 51	19 31	86	63	
1908	32	2 16 97	32 35	136	64	
Mean.	—	2 6 84	27 31	128	62-13	

NOTES ON TABLE XIV.

We shall note in the first place that, notwithstanding the high average yields of the No-Manure Plots, the average Grain and Hay yields of the Superphosphate Plots were considerably in excess of them; whilst on the other hand the average yields of Plots dressed with both Superphosphate and Nitrate of Soda were in excess of those dressed with Superphosphate alone. Let us next endeavor to look at these increased yields from the financial standpoint, adopting for the purpose the following current rates:—Wheat at 3s. 9d. a bushel, Hay at 1s. 9d. a hundredweight, Superphosphate at 4s. 4d. a hundredweight, and Nitrate of Soda at 14s. a hundredweight.

TABLE XV.—*Showing Net Profits realised over and above No-Manure Plots on average Grain yields, 1905-08.*

Plots.	Average 1905-08 Yields.	Average Ex- cess Over No-Manure Plot.	Value of Average Excess.	Cost of Manure.	Net Profit Over No- Manure Plot Per Acre.
	bush. lbs.	bush. lbs.	£ s. d.	£ s. d.	s. d.
No Manure	21 8	—	—	—	—
2cwt. Superphosphate ...	25 49	4 41	0 17 7	0 8 8	8 11
2cwt. Superphosphate.					
2cwt. Nitrate of Soda {	28 6	6 58	1 6 1	1 2 8	3 5
(at seedtime)					
2cwt. Superphosphate,					
2cwt. Nitrate of Soda {	27 31	6 23	1 3 11	1 2 8	1 3
(in Spring)					

Thus we see that if we do not attach any value to the straw produced, whilst the use of Superphosphate alone leaves us with a substantial Profit per acre, the use of Nitrate of Soda, whilst leading to an increased yield of Grain, does so at a loss, at present values of Wheat and Nitrate of Soda respectively. Nor is the position improved if we take into consideration the Profits derivable from a Hay Crop, as is shown in Table XVI. below.

TABLE XVI.—*Showing Net Profits realised over and above No-Manure Plots on average Hay yields, 1905-08.*

	Average 1905-08 Yields.	Average Excess Over No- Manure Plot.	Value of Average Excess.	Cost of Manure	Net Profit Over No- Manure Plot Per Acre.
	tons. cwt. lbs.	cwt. lbs.	£ s. d.	£ s. d.	s. d.
No Manure	1 11 26	—	—	—	—
2cwt. Superphosphate .	2 5 95	14 — 69	1 5 7	0 8 8	16 11
2cwt. Superphosphate,					
2cwt. Nitrate of Soda {	2 8 8	16 94	1 9 6	1 2 8	6 10
(at seed time)					
2cwt. Superphosphate,					
2cwt. Nitrate of Soda {	2 6 84	15 58	1 7 2	1 2 8	4 6
(in spring)					

The increase in yield obtained from the use of 1cwt. of Nitrate of Soda for a Hay crop is again shown to have been secured at a loss at prevailing rates. From another standpoint it should be noted how much more profitable is a Hay crop than even a really good Grain crop. Thus the Grain crop dressed with 2ewts. of Superphosphate to the acre leaves a profit of only 8s. 11d. over the No-Manure Plot, with Wheat at 3s. 6d., whilst the same crop cut as Hay leaves a Profit almost double, viz., 16s. 11d., with Hay at 35s. a ton.

Nitrogenous manures such as Nitrate of Soda are usually said to lead to an exaggerated growth of Straw at the expense occasionally of the Grain. That such has not proved the case is well shown in Table XIV., in which the proportion of Straw to Grain is shown to be greater in Plots dressed with Superphosphate alone than in those to which Nitrate of Soda as well has been added. Nor on the whole is there much difference in the average Bushel weight of the several Plots, although generally in favor of the Plots with the least Manure.

If Nitrate of Soda is to be used at all, it would appear from these returns that the safest time to apply it would be at seedtime, and not as a top dressing in spring, as is the custom in moister countries.

SECOND SERIES.—MANURES ON LAND CONTINUOUSLY UNDER WHEAT.

In 1905 this Series consisted of seven Plots (Nos. 34 to 40 inclusively); in 1906 and 1907 the number of plots was raised to 16, Plots Nos. 43 to 51 inclusively having been added to those already in existence. At the outset it must be recognised that, so far as the immediate object originally aimed at is concerned, this Series of Plots must to all intents and purposes be taken to have failed. It was assumed originally that with the aid of various artificial Manures it would have been possible, for a number of years at all events, to raise continuously on the same land fairly good crops of Wheat. Had this been at all possible, it was thought that the effect of the several Manures would have been more strikingly illustrated in a Series of continuous crops than when due allowance has to be made for the regular interruptions involved by the alternation of years of bare fallow. Unfortunately at the time the difficulties before us were altogether underrated. The area involved in these experiments was in the first place relatively large, approximating as it did 32 acres; and each year shortly after the removal of the Wheat crop, to put this area in a state of tilth adequate to the requirements of a succeeding Wheat crop, which at the same time must prove tolerably free from weeds, proved altogether beyond the means at our disposal. We have already shown in an earlier portion of this Report that we have experienced no difficulty in making Wheat follow successfully some other crop different in nature; but we have failed completely in our endeavors to make Wheat

follow Wheat, and not, we think, because the local conditions of climate render the task more or less impossible, but mainly because, without neglecting other work of major importance, we found ourselves unable to lend to these Plots that time and attention which alone could command any degree of success.

A glance at the First Report on the Permanent Experiment Field will show that in 1905, the first year of the establishment of these Plots, the results recorded were excellent. In this opening year, however, all Wheat crops had been immediately preceded by a year's bare fallow. In 1906 the results were already very poor, falling for the seven original Plots (Nos. 34 to 40) from a general average of 29bush. 26lbs. in 1905 to an average of 9bush. 15lbs. in 1906, whilst in 1907 the general average of these seven original Plots had fallen away to the insignificant yield of 3bush. 53lbs. It is of course perfectly true that with us, as a Wheat season, 1905 was distinctly superior to either 1906 or 1907. Whatever superiority may, however, have existed cannot adequately account for so enormous a reduction in yields; and that such is the case can readily be shown by an examination of the average returns of the neighboring Plots of the First Series over the same period of time. Thus these Plots of the First Series, always preceded by Bare Fallow, but far less heavily manured than the bulk of those of the Second Series, showed in 1905 a general average of 31bush. 59lbs., in 1906 an average of 21bush. 16lbs., and in 1907 an average of 19bush. 10lbs. We are therefore well justified in attributing the low 1906 and 1907 yields of the Plots of the Second Series mainly to the fact that they represented Wheat crops following one another year after year on the same land.

In 1908 we concluded that, besides involving the waste of much time and labor, there was nothing to be gained by further attempts in the direction of growing Wheat continuously on the same land. We determined therefore to close this Second Series, and to place the whole of the area of the Plots involved under Bare Fallow; this accordingly was done.

In bringing this Series of experiments to an end we are forced to recognise that, notwithstanding the time and trouble lavished on them, there is little of practical interest that can be derived from the results secured over the three years concerned. The fate of these Plots may perhaps serve to emphasise a fact well known to most farmers, but which will perhaps bear repeating here, and that is that not all the Manures in the world can adequately make up for essentially bad tillage. Whatever the vagaries of the season, in our district at all events, a fair crop can always be reaped with the sole aid of rational and good tillage. This crop may be improved, very considerably at times, by the judicious use of Manures. Bad tillage on the other hand, whatever the season and whatever the nature and quantities of Manures used, will invariably lead to poor crops.

We append below, in Table XVII., without further comment, and purely for purposes of reference, the result of three years' more or less fruitless experiments.

TABLE XVII.—*Showing 1905, 1906, and 1907 returns from Plots continuously under Wheat.*

Plot.	Year.	Manures.	Total Produce Per Acre.	Grain Per Acre.	Straw to 60lbs. of Grain.	Weight of Bushel.
34	1905	2cmts. Superphosphate,	3 2 11	34 29	141	63
	1906	½cwt. Nitrate of Soda	1 17 52	14 13	235	59 $\frac{3}{4}$
	1907		0 10 75	6 13	132	61 $\frac{3}{4}$
Mean			1 16 83	18 18	169	61 $\frac{1}{2}$
35	1905	2cmts. Superphosphate,	2 18 20	30 20	157	63 $\frac{1}{2}$
	1906	1cwt. Nitrate of Soda	1 10 7	11 7	243	61
	1907		0 6 90	4 18	117	61 $\frac{1}{2}$
Mean			1 11 76	15 15	172	62
36	1905	2cmts. Superphosphate,	2 17 52	28 8	170	63 $\frac{1}{2}$
	1906	½cwt. Sulphate of Pot-	1 6 23	8 58	267	59 $\frac{1}{4}$
	1907	ash	0 4 28	2 52	106	63
Mean			1 9 52	13 19	181	61.92
37	1905	2cmts. Superphosphate,	2 17 32	27 56	170	63
	1906	1cwt. Sulphate of Pot-	1 2 65	7 43	267	61
	1907	ash	0 5 7	3 23	108	61 $\frac{3}{4}$
Mean			1 8 35	13 1	182	61.92
38	1905	2cmts. Superphosphate,	3 4 69	30 58	177	62
	1906	½cwt. Nitrate of Soda,	1 14 57	9 22	270	60
	1907	½cwt. Sulphate of Potash	0 7 21	4 16	129	61 $\frac{1}{2}$
Mean			1 15 49	14 52	192	61.16
39	1905	2cmts. Superphosphate,	3 1 16	31 26	158	63
	1906	1cwt. Nitrate of Soda,	1 1 48	6 30	309	58
	1907	1cwt. Sulphate of Potash	0 7 7	3 59	139	60 $\frac{3}{4}$
Mean			1 9 98	13 58	202	60.58
40	1905	No Manure	2 1 9	22 16	147	63
	1906	2cmts. Superphosphate ..	1 4 33	6 49	340	57
	1907	"	0 4 35	2 11	161	61
Mean			1 3 26	10 25	216	60.3
43	1905	3cmts. Superphosphate,	2 5 102	19 17	207	60
	1907	1cwt. Nitrate of Soda	1 0 3	14 6	99	61 $\frac{3}{4}$
Mean			1 12 103	16 41	153	60.87

TABLE XVII.—*continued.*

Plot.	Year.	Manures.	Total Produce Per Acre.			Grain Per Acre. bush. lbs.	Straw to 60 lbs. of Grain. bushel. lbs.	Weight of Bushel. lbs.
			tons.	cwts.	lbs.			
44	1905	No Manure	1	8	31	15	25	145
	1906		1	0	102	4	35	431
	1907		0	6	64	4	38	99
	Mean	.....	0	18	66	8	13	225
45	1906	2cwts. Superphosphate, ½cwt. Sulphate of Am- monia	2	7	66	21	10	192
	1907		0	18	36	14	4	86
	Mean	.....	1	12	107	17	37	139
46	1905	2cwts. Rock Phosphate ..	1	13	81	18	33	144
	1906	2cwts. Superphosphate, 1cwt. Sulphate of Am- monia	1	2	42	7	39	267
	1907		0	7	77	5	22	100
	Mean	.....	1	1	29	10	31	170
47	1906	2cwts. Superphosphate, { ½cwt. Muriate of Potash {	2	5	55	20	19	191
	1907		0	19	92	16	17	77
	Mean	.....	1	12	73	18	18	134
48	1905	No Manure	1	18	40	21	42	138
	1906	2cwts. Superphosphate, { 1cwt. Muriate of Potash {	0	19	27	6	50	256
	1907		0	8	102	7	15	78
	Mean	.....	1	2	19	11	56	157
49	1905	1cwt.. Superphosphate ..	2	6	56	27	2	133
	1906	3cwts. Superphosphate, { ½cwt. Nitrate of Soda {	0	17	29	5	59	263
	1907		0	11	25	8	46	83
	Mean	.....	1	4	111	13	66	160
50	1906	3cwts. Superphosphate, { 1cwt. Nitrate of Soda, {	2	10	11	18	7	250
	1907		1	2	64	20	18	64
	Mean	.....	1	16	38	19	12	157
51	1906	2cwts. Superphosphate, { ½cwt. Nitrate of Soda . {	2	6	87	17	38	237
	1907		1	0	109	16	12	85
	Mean	.....	1	13	98	16	55	161
								60.87

THIRD SERIES.—MISCELLANEOUS MANURE PLOTS OF WHEAT AFTER
BARE FALLOW.

The 12 Plots of this Series cover the following Manure tests:—Fourteen tons of Farmyard Manure spread over the fallow, Thomas Phosphate, Superphosphate alone, and Superphosphate with Nitrate of Soda. Included in the Plots is a second pair of No-Manure Plots. The results of the four years' tests are shown below in Table XVIII.

TABLE XVIII.—*Showing returns of various Manures on Wheat after Bare Fallow.*

Plot.	Year.	Manures.	Total Produce per Acre.			Grain per Acre, bush.	Straw to 60lbs. of Grain, lbs.	Weight of Bushels.	
			tons	cwts.	Ibs.				
41	1906	14 tons Farmyard Manure	1	19	50	16	4	215	
42	1907		1	1	6	14	31	102	
41	1908		2	0	80	23	19	136	
Mean			1	13	83	17	58	151	
53	1905	No Manure	1	17	30	18	32	165	
52	1906		2	0	91	15	57	227	
53	1907		0	18	17	13	21	91	
52	1908		2	0	96	24	35	126	
Mean			1	14	30	18	6	152	
54	1906	2cwts. Thomas' Phosphate	2	3	44	18	21	204	
55	1907		—	—	—	14	8	64	
54	1908		2	4	45	26	45	126	
Mean			1	15	41	19	45	61 $\frac{1}{4}$	
56	1906	3cwts. Thomas' Phosphate	2	2	52	19	39	182	
57	1907		0	17	82	13	58	82	
56	1908		1	15	45	32	14	64 $\frac{1}{2}$	
Mean			1	11	97	21	57	62	
59	1905	2cwts. Superphosphate	2	7	28	28	10	128	
58	1906		2	11	60	20	49	217	
59	1907		0	19	13	14	58	83	
58	1908		3	1	111	38	21	121	
Mean			2	4	109	25	35	137	
60	1906	2cwts. Superphosphate, $\frac{1}{4}$ cwt. Nitrate of Soda	2	3	108	20	51	176	
61	1907		1	3	10	17	48	84	
60	1908		2	18	32	37	27	113	
Mean			2	1	87	25	29	124	
								61.42	

From the data supplied in Table XVIII. we shall note the following points:—

1. A dressing of 14 tons of Farmyard Manure to the acre, applied to the land in the early winter before fallowing operations, has, neither as to Grain nor as to Hay, given results in any way superior to those of the No-Manure Plots. The average weight of the bushel of Grain was, on the other hand, 1 $\frac{1}{4}$ lbs. below that of the No-Manure Plot.
2. The Plots dressed with Thomas Phosphate, 2cwts. and 3cwts. respectively, were slightly better in their average yields than the No-Manure Plots, but considerably below the Superphosphate Plot, both as to Grain and as to Hay.
3. The addition of $\frac{1}{4}$ cwt. of Nitrate of Soda to a 2cwt. dressing of Superphosphate does not appear to have led to any increase either in Grain or in Hay, whilst it has apparently led to a slight reduction in the average weight of the bushel of Grain.

THE WHEAT MARKET.

The price of wheat, which rose from 4s. 9d. to 4s. 10d. on June 29th, remained at the latter figure until July 30th, when it was reduced by 1d. On August 6th another reduction of 1d. per bushel was made. The market in Victoria has been even steadier than in South Australia, for there the price was practically 5s. per bushel from June 1st until July 27th, when a drop of 1d. per bushel took place. The difference in the Port Adelaide and Melbourne quotations at present is 1d. to 1½d. per bushel. Notwithstanding the arrival of heavy supplies in England, the market there has also been remarkably steady, due largely to a strong demand from Germany.

South Australian farmers are not, however, much concerned about present prices, but are looking forward to the prospects of this year's crop. All the States have had splendid seeding weather, and at the present time there is every promise of an abundant harvest, which will have to be marketed on the other side of the world. No one can foretell the state of the markets five or six months hence, but the news from the Argentine is interesting to Australia, seeing that that country markets its wheat at the same time, and has much more influence on prices than the comparatively small quantity exported from Australia. The following extracts from telegrams from Buenos Ayres, as published in *Beerbohm's Evening Corn Trade List*, will therefore be interesting:—

May 27th. Report of British Consul at Buenos Ayres—"The present season has been the driest experienced for many years, and for the past three months practically no rain has fallen in any part of the Republic. The drought is more particularly felt in the South, and the effect of it has been accentuated by recent frosts. The drought and cold has made the ground so hard that ploughing is quite impossible, and little or no land has as yet been prepared for seed. Even should abundant rain come, it would be very difficult to have the same area prepared as was ploughed last year, and in any case the harvest is likely to be late, and so the growing crops will be exposed to destruction from locusts."

June 3rd—"The weather continues unfavorable, and prospects are gloomy. There are, however, signs of a change to wet weather."

June 10th—"The climatic advices from the provinces are more cheerful, good rains being reported throughout the country. It is hardly to be expected, in view of the late and unfavorable sowing period, that the expected increase in the area will take place."

June 17th—"Advices from the interior are not as assuring as they should be, and farmers are anxiously looking for further beneficial rains. Complaints in regard to wheat sowings are quite serious in Cordoba, Santa Fe, and Entre Rios, and a great shortage in the area sown in the northern provinces is inevitable."

June 24th—"Weather conditions are still unfavorable for field work and sowing; the temperature is cool and droughty conditions still prevail. A material decrease in the area of next year's crops is anticipated, some experts putting the reduction resulting from the want of moisture at 30 per cent."

July 1st—"It is now regarded as inevitable that the area to be sown with wheat this season will be materially smaller than last year, while the sowing season as a whole has been late and unfavorable."

Date.	LONDON (Previous Day).			PORTADELAIDE.			MELBOURNE.			SYDNEY.		
		Per Bushel.		Per Bushel.			Per Bushel.			Per Bushel.		
July 5	Steady, quiet	..	..	4/10	..	..	5/0½ ex store	..	..	5/4	..	..
6	Unchanged	..	..	4/10	..	..	5/0½ to 5/1	..	..	Holders firm	..	..
7	Steady, but quiet	..	..	4/10	..	..	5/1 to 5/2½	..	..	5/4 to 5/4½	..	..
8	Very dull; Liverpool off coast 5/7½ to 5/8½ (s.)	..	..	4/10	..	..	5/- to 5/0½	..	..	Market dull	..	..
9	Steady; Liverpool firmer; sailer April 5/8½	..	..	4/10	..	..	5/0½ to 5/1	..	..	5/4½ on trucks	..	..
10	Very dull; Liverpool steady; quiet.	..	..	4/10	..	..	—	..	..	—	..	..
11	—	..	..	4/10	..	..	5/- to 5/0½	..	..	Market strong	..	..
12	Steady, but quiet	..	..	4/10	..	..	5/1 (s.)	..	..	5/4 to 5/4½ (s.)	..	..
13	Liverpool firm, quiet	..	..	4/10	..	..	5/1	..	..	5/4 to 5/4½ (s.)	..	..
14	Firm, quiet; Liverpool 4/8 (s.) off coast	..	..	4/10	..	..	4/11½ to 5/- (nom.)	..	..	Market quiet	..	..
15	Firm, quiet; Liverpool 4/8 (s.) off coast	..	..	4/10	..	..	5/-	..	..	5/3¾ (s.)	..	..
16	Dearer; Liverpool 5/8½ off coast; 5/6½ to 5/7½ adroit	..	..	4/10	..	..	4/11½ to 5/4	..	..	Market quiet	..	..
17	Firm, but inactive	..	..	4/10	..	..	4/11 to 5/-	..	..	Market quiet	..	..
18	—	..	..	4/10	..	..	4/11½ to 5/4	..	..	Market quiet	..	..
19	Steady, quiet; Liverpool with easier tendency	..	..	4/10	..	..	4/11 to 5/4	..	..	Market quiet	..	..
20	Very dull; Liverpool firm, but inactive	..	..	4/10	..	..	5/1 (s.)	..	..	—	..	..
21	Quiet	..	..	4/10	..	..	5/-	..	..	5/3½ to 5/4	..	..
22	Very weak	..	..	4/10	..	..	5/1 (s.)	..	..	5/3½ parcels	..	..
23	Quiet	..	..	4/10	..	..	4/11½ parcels (s.)	..	..	5/3½ parcels	..	..
24	—	..	..	4/10	..	..	4/11½ to 5/-	..	..	—	..	..
25	Very dull	..	..	4/10	..	..	4/11 to 4/11½	..	..	5/3 ex Darling Isld.	..	..
26	Very dull	..	..	4/10	..	..	4/11 to 4/11½	..	..	5/3 to 5/3½	..	..
27	Very dull	..	..	4/10	..	..	4/11 to 4/11½	..	..	5/3 to 5/3½	..	..
28	Very dull; 5/7 off coast (s.)	..	..	4/10	..	..	4/11 to 4/11½	..	..	—	..	..
29	Quiet	..	..	4/10	..	..	4/11	..	..	5/3 to 5/3½	..	..
30	Steady; quiet	..	..	4/9	..	..	4/10½	..	..	5/3 to 5/3½	..	..
31	Steady; quiet	..	..	4/9	..	..	4/10½ ex store	..	..	5/3 to 5/3½	..	..
August 2	—	..	..	4/9	..	..	4/10 to 4/10½	..	..	Market inactive.	..	..
3	Very dull	..	..	4/9	..	..	4/9½ to 4/10½	..	..	Weakener.	..	..
4	Very dull	..	..	4/9	..	..	4/9 to 4/10	..	..	5/2 to 5/3 (nom.)	..	..
5	—	..	..	4/8	..	..	4/9	..	..	—	..	..
6	—	..	..	—	..	..	—	..	..	—	..	..

SAILER FREIGHTS.—Port Adelaide to London, 21/- per ton (6/7d. per bush.); Port Adelaide to South Africa, 17/6 per ton (5½d. per bush.).

STEAMER FREIGHTS.—Port Adelaide to Sydney, 10/6 per ton (3½d. per bush.); Port Adelaide to Melbourne, 8/- per ton (2½d. per bush.).

RAINFALL TABLE.

The following table shows the rainfall for July, 1909, at the undermentioned stations, also the average total rainfall for the first seven months in the year, and the total for the seven months of 1909 and 1908 respectively:—

Station.	For July, 1909.	Av'ge. to end July.	To end July, 1909.	To end July, 1908.	Station.	For July, 1909.	Av'ge. to end July.	To end July, 1909.	To end July, 1908.
Adelaide	3.51	12.67	14.54	14.63	Hamley Brdg.	3.79	9.67	10.97	8.68
Hawker	1.28	6.85	10.11	5.32	Kapunda	4.21	11.56	15.02	8.92
Cradock	0.87	6.28	8.62	4.36	Freeling	3.65	10.34	11.52	9.15
Wilson	0.97	6.86	8.93	5.83	Stockwell	3.62	11.70	13.42	10.01
Gordon	0.53	8.72	8.65	6.08	Nuriootpa	5.37	12.28	15.04	11.13
Quorn	1.70	7.69	10.57	6.59	Angaston	4.41	12.44	16.29	11.87
Pt. Augusta ..	0.71	5.50	8.09	6.15	Tanunda	3.85	12.84	16.90	10.73
Pt. Germie ..	1.49	7.30	9.44	9.00	Lyndoch	3.71	13.43	15.16	13.17
Port Pirie ...	1.85	7.61	8.46	7.70	Mallala	3.26	9.97	10.63	10.29
Crystal Brook	2.73	8.68	10.65	9.74	Roseworthy ..	3.53	10.22	12.08	9.53
Pt. Broughton	1.71	8.48	9.07	7.41	Gawler	3.74	11.42	14.21	10.96
Bute	1.25	9.16	8.45	9.91	Smithfield ..	2.82	9.93	11.57	12.09
Hammond ..	1.41	6.18	9.88	9.23	Two Wells	2.78	10.31	9.25	9.32
Bruce	0.76	5.17	7.52	12.10	Virginia	3.21	10.58	11.69	11.06
Wilmington ..	2.77	10.20	14.24	11.21	Salisbury	2.76	11.13	11.95	11.06
Melrose	4.31	13.62	20.53	20.41	Teatree Gully	5.05	17.00	22.45	22.33
Booleroo Cntr.	2.58	8.92	11.72	9.16	Magill	5.64	15.69	21.07	19.19
Wirrabara ...	4.15	10.87	16.86	8.58	Mitcham	4.64	14.66	17.36	15.34
Appila	2.28	8.35	10.49	9.31	Crafers	10.41	27.69	40.14	32.07
Laura	2.98	9.96	15.68	13.29	Clarendon ..	6.11	20.47	25.75	20.11
Caltowie	2.24	9.47	10.86	10.77	Morphett Vale	4.86	14.26	17.52	13.05
Jamestown ..	3.01	9.47	11.40	8.65	Noarlunga	4.57	12.40	15.38	13.70
Gladstone ..	1.91	8.76	9.85	10.42	Willunga	6.07	15.79	21.11	14.30
Georgetown ..	2.44	10.50	11.10	9.44	Aldinga	5.01	12.53	15.98	12.09
Narryid	2.04	9.64	9.23	8.41	Normanville ..	4.29	12.84	15.24	11.61
Redhill	3.04	9.56	11.41	11.04	Yankalilla	3.71	14.15	14.66	13.80
Koolunga	2.57	9.00	10.39	9.89	Eudunda	—	9.58	7.77	8.19
Carrieton ..	1.73	6.63	10.20	6.39	Sutherlands ..	1.67	5.44	6.15	—
Eurelia	1.60	7.18	9.51	8.91	Truro	4.22	11.06	14.36	9.86
Johnsbury ..	1.15	5.26	8.41	4.02	Palmer	1.98	—	9.67	8.68
Orroroo	1.94	7.84	10.21	7.21	Mt. Pleasant	3.87	16.07	17.79	15.92
Black Rock ..	1.80	6.83	10.36	6.80	Blumberg	4.11	17.83	19.87	18.89
Petersburg ..	1.33	7.12	8.71	6.68	Gumeracha	5.26	19.57	26.78	20.00
Yongala	1.71	7.44	8.99	6.20	Lobethal	6.22	21.27	27.67	20.34
Terowie	1.51	7.28	8.48	6.89	Woodside	5.44	18.44	24.50	19.89
Yarcowie	1.61	7.62	9.25	6.42	Hahndorf	5.93	20.68	24.61	20.80
Hallett	1.71	9.10	8.93	8.42	Nairne	4.94	16.95	22.56	16.38
Mt. Bryan ..	2.12	8.91	8.80	5.39	Mt. Barker	4.70	18.21	23.00	16.45
Burra	2.71	10.23	11.86	8.73	Echunga	6.07	19.39	27.83	18.62
Snowtown	1.90	9.13	10.35	11.35	Macclesfield	4.84	17.59	24.51	17.70
Brinkworth ..	1.93	8.52	9.37	10.25	Meadows	5.75	20.86	27.99	20.99
Blyth	2.91	9.48	12.00	10.63	Strathalbyn	2.98	11.27	15.37	11.52
Clare	4.32	4.22	16.72	14.07	Callington	2.27	9.32	10.03	8.46
Mintaro Cntrl.	3.62	12.49	14.90	11.72	Langhorne's B	2.98	8.95	10.24	7.88
Watervale ...	4.53	15.83	18.28	15.88	Milang	2.93	10.31	10.46	10.31
Auburn	6.06	14.07	20.15	13.68	Wallaroo	1.74	8.65	9.07	9.83
Manoora	3.65	10.07	11.24	9.69	Kadina	2.46	9.94	10.78	9.30
Hoyleton	2.83	10.74	10.36	9.72	Moonta	2.29	9.62	11.39	9.69
Balaklava ..	2.93	9.43	9.67	9.91	Green's Plains	2.38	9.52	10.82	12.21
Pt. Wakefield	1.89	8.15	6.84	9.62	Maitland	3.79	12.41	13.23	12.95
Saddleworth ..	4.18	11.70	12.16	10.02	Ardrossan	2.54	8.43	8.34	12.08
Marrabel ...	5.42	10.91	14.90	9.70	Pt. Victoria	2.51	9.50	8.79	10.48
Riverton	4.95	11.86	15.04	10.06	Curramulka	3.58	11.42	12.03	9.35
Tarlee	4.54	10.04	12.68	7.92	Minlaton	3.81	10.70	10.84	9.48
Stockport ...	3.40	9.39	10.26	7.40	Stansbury	3.84	10.28	11.92	10.03

RAINFALL TABLE—*continued.*

Station.	For July, 1909.	Av'ge. to end July.	To end July, 1909.	To end July, 1908.	Station.	For July, 1909.	Av'ge. to end July.	To end July, 1909.	To end July, 1908.
Warooka ...	3.12	10.93	9.94	10.80	Bordertown .	3.26	11.26	12.94	9.36
Yorketown .	3.22	10.70	9.99	8.76	Wolseley ...	2.93	9.89	12.55	9.17
Edithburgh .	2.37	10.15	10.06	9.00	Frances	2.15	11.14	12.07	9.01
Fowler's Bay.	1.72	8.30	6.99	9.13	Naracoorte .	2.70	12.80	15.79	11.14
Streaky Bay.	4.10	9.98	11.17	11.05	Lucindale ...	3.61	13.47	17.27	12.91
Pt. Elliston .	3.44	10.56	10.96	12.50	Penola	3.45	15.25	17.61	13.97
Pt. Lincoln .	3.34	12.44	12.11	12.31	Millicent	5.77	17.74	25.51	18.96
Cowell	0.88	7.00	4.84	9.17	Mt. Gambier .	5.29	18.34	26.34	18.21
Queenscliffe .	3.81	11.61	12.03	11.14	Wellington ..	2.82	8.80	10.91	8.46
Port Elliot ..	3.65	12.53	10.83	10.01	Murray Bridge	2.38	8.27	10.94	7.59
Goolwa	4.08	10.76	14.38	10.36	Mannum ...	1.24	7.00	8.04	5.87
Meningie....	3.71	11.39	13.90	10.16	Morgan	1.08	4.92	5.00	3.52
Kingston....	5.07	15.18	20.54	19.24	O'rland Corner	0.94	6.30	5.68	4.43
Robe	5.72	5.39	20.98	16.06	Renmark....	0.93	5.71	6.55	3.13
Beachport...	6.05	17.21	26.49	17.34	Lameroo ...	1.84	—	9.61	—
Coonalpyn ...	2.76	10.24	13.72	9.42					

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co. report, on August 1st:—

WEATHER.—Almost unprecedented rains fell throughout July, this applying especially to the Lower North, South, and South-East, where the downpours have considerably exceeded the average. The Upper North has not participated to the same extent, but taken all round it has been an excellent month for farmers and graziers generally.

BREADSTUFFS.—The wheat market was marked by inactivity; farmers sold small lots sparingly, while inquiries for parcels led to a very limited business, and prices at the close weakened 1d. per bushel. Flour remained dull, export sales being unusually light, but no change was made in quotations. Fodders.—There were oversea sales in chaff of a very limited character, Sydney operating only to a small extent here, and then mostly in execution of previous contracts; this owing to Victoria securing the orders at lower quotations. Business locally was on the quiet side on account of the plenteous supply of green fodders. Bran and pollard moved steadily at the closing rates of previous month. Feeding Grains.—Very fair sales were put through in oats, with market just about holding.

POTATOES AND ONIONS.—In potatoes there was an element of uncertainty, owing to Tasmanian grown being affected by disease, resulting in quantities being rejected for table purposes. This disturbed values considerably in the Commonwealth and a sharp advance was recorded, but rates have now receded. Meanwhile Mount Gambier holders are selling more freely, whilst Adelaide traders are also operating on the Victorian market. Onions.—Although the turnover has been light, selling values have well held in consequence of supplies at this time being rather limited.

DAIRY PRODUCE.—All indications point to an early butter season. The pleasing feature of the past month was the rapid increase in supplies, and once more South Australia is not only raising sufficient for local consumption but is already selling to the neighboring States, so that the next step will undoubtedly be a resumption of business with Great Britain. Prices had to come back from the previously tall rates, but this was only gradual, as the trade at the markets have operated very spiritedly for all fresh

prints. Eggs.—The seasonable run down in values was more pronounced during July than at corresponding period of late years. However, as the larger manufacturers will soon commence purchasing, selling rates should shortly steady. Cheese.—Better demand than usual has been experienced this winter, so that very little old stock is being carried over, which is satisfactory, as buyers are now already giving preference to the newer makes. Bacon and Hams.—A quiet month's business was recorded, with a tendency to lowering prices. Honey.—Good inquiry ruled for prime clear extracted, but secondary qualities had practically little call. Almonds.—Under the influence of continued buying orders for export, selling rates have been well maintained.

CARCASS MEAT.—The butchering trade and restaurant keepers attended the Friday markets in good numbers, when all consignments of bright shop porkers weighing 60lbs. to 90lbs. obtained very satisfactory figures, as also prime baconers from 110lbs. to 135lbs., whilst well-fed heavy choppers sold readily. Prime farm-fed veal, well dressed, with pelt on, but without head, feet, and pluck, met with active competition, but with poor and light sorts there was the usual difficulty to quit.

DRESSED POULTRY.—At the Friday auctions there was brisk bidding, and all lots of good table sorts of well dressed fowls and turkeys found ready clearance.

LIVE POULTRY.—Although the pennings at each sale were invariably extensive, the trade operated very freely, resulting in good prices being secured for nice conditioned table birds.

MARKET QUOTATIONS OF THE DAY.

FLOUR.—City brands, £11 15s. ; country, £11 10s. per ton of 2,000lbs.

BRAN.—11½d. ; POLLARD, 1s. 1d. per bushel of 20lbs.

OATS.—Local Algerians, 1s. 11d. to 2s. ; White Champions, 2s. 5d. to 2s. 6d. per bushel of 40lbs.

BARLEY.—Cape, for feed, 2s. 4d. to 2s. 5d. per bushel of 50lbs.

CHAFF.—£3 10s. to £3 12s. 6d. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £5 to £5 5s. per ton of 2,240lbs.

ONIONS.—Gambiers, £8 to £8 10s. per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 1s. 0½d. to 1s. 2d. ; choice separator and fine dairies, 11½d. to 1s. 0½d. ; medium dairy and poor creamery, 10½d. to 11d. ; stores and collectors, 9½d. to 10½d. per lb.

CHEESE.—Factory makes, 7d. to 8d. per lb. for large to loaf.

BACON.—Factory cured sides, 7½d. to 8½d. per lb.

HAMS.—Factory, in calico, 8½d. to 9d. per lb. ; country hams, 8½d. to 9½d. per lb.

Eggs.—Loose, 9d. per dozen.

LARD.—Skins, 7d. ; tins or bulk cases, 6½d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb. ; ill-flavored and dark lots, 1½d. per lb.

BEESWAX, 1s. 1d. per lb.

ALMONDS.—Soft shells, Brandis, 6½d. ; mixed soft shells, 5½d. ; kernels, 1s. 1½d. per lb.

CARCASS MEAT.—Prime shop porkers, 5½d. to 6½d. per lb. ; nice baconers to medium porkers, 5d. to 5½d. ; heavy weights, 2½d. to 3½d. ; prime veal, 3d. to 3½d. ; medium, 1½d. to 2d.

DRESSED POULTRY.—Turkeys, worth 8d. to 9d. ; fowls, 5½d. to 6½d. per lb.

LIVE POULTRY.—Heavy-weight table roosters, 2s. 9d. to 3s. 3d. each ; light cockerels, 1s. 9d. to 2s. 6d. ; hens, 1s. 5d. to 1s. 10d. ; ducks, 2s. to 3s. ; geese, 3s. 9d. to 4s. 6d. ; pigeons, 4½d. ; turkeys, 6½d. to 8½d. per lb., live weight, for fair to good table birds.

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Aug.	Sept.			Aug.	Sept.
Amyton	55	—	—	Meadows	†	—	—
Angaston	65	28	25	Meningie	*	28	—
Appila-Yarrowie	*	—	—	Millicent	*	17	21
Arden Vale & Wyacca	55	30	27	Miltalie	73	28	25
Arthurton	69	—	—	Minlaton	71	7	4
Bagster	*	—	—	Morchart	*	—	—
Balaklava	66	14	11	Morgan	76	28	25
Beetaloo Valley	59	30	—	Morphett Vale	*	17	—
Bela'ie North	*	28	25	Mount Bryan	62	2	—
Bowhill	*	—	—	Mount Bryan East ..	63	28	25
Brinkworth	60	10	14	Mount Gambier	84	14	—
Bute	70	24	—	Mount Pleasant	81	13	10
Butler	†	—	—	Mount Remarkable	†	26	23
Caltowie	61	30	27	Mundoora	†	—	—
Carrieton	55	26	23	Nantawarrar	68	25	29
Cherry Gardens	79	31	28	Naraocoote	†	14	11
Clare	†	27	24	Narridy	64	28	—
Clarendon	78	30	27	Northfield	†	31	28
Colton	†	28	—	Orroroo	*	—	—
Coomooroo	56	30	—	Paskeville	†	28	25
Coonalpyn	†	—	—	Penola	†	14	11
Cradock	56	28	25	Penong	74	14	11
Crystal Brook	61	—	—	Petina	*	—	—
Cummins	72	28	25	Pine Forest	71	31	28
Davenport	57	—	—	Port Broughtou	64	27	24
Dawson	57	7	—	Port Elliot	81	21	18
Dingabledinga	79	14	10	Port Germlein	64	28	—
Dowlingville	70	—	—	Port Pirie	*	25	25
Forest Range	79	26	23	Quorn	58	—	—
Forster	†	28	25	Redhill	*	21	18
Fowler Bay	†	28	25	Renmark	77	—	—
Gawler River	67	—	—	Rhine Villa	77	—	—
Georgetown	62	28	—	Riverton	*	28	25
Golden Grove	†	26	23	Saddleworth	*	20	17
Goode	*	30	27	Shannon	74	—	—
Green Patch	*	30	27	Sherlock	77	—	—
Gumeracha	80	—	—	Smoky Bay	*	—	—
Hartley	*	28	—	Stockport	69	2	—
Hawker	*	26	23	Strathalbyn	83	16	20
Inkerman	58	28	—	Sutherlands	*	25	22
Johnsburg	58	—	—	Tatiara	86	—	—
Kadina	†	5	4	Uraidla and Summert'n	83	2	6
Kanmantoo	†	27	24	Utero Plains	75	28	25
Kingscote	80	2	6	Virginia	†	—	—
Kingston	*	28	25	Waikerie	†	—	—
Koolunga	*	31	28	Watervale	69	—	—
Koppio	*	26	23	Wepowie	†	—	—
Kybybolte	84	26	23	Whyte-Yarcoorie	64	28	25
Lameroo	76	—	—	Willunga	83	7	4
Lipson	*	—	—	Wilmington	†	26	23
Longwood	81	25	29	Wirrabara	59	—	—
Lucindale	†	8	—	Woodside	†	—	—
Lyndoch	†	26	—	Yallunda	75	—	—
Maitland	71	7	4	Yongala Vale	*	—	25
Mallala	67	2	6	Yorketown	*	14	11
Mannum	76	28	25				

* No report received during the month of July.

† Only formal business transacted at the last meeting.

REPORTS OF MEETINGS.

Edited by W. I. SUMMERS.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

Amyton, June 29.

(Average annual rainfall, 11½in.)

PRESENT—Messrs. O'Donoghue (chair), Crisp, Wallace, Baumgurtel, Bristow, Brown, Quirke, T. and W. Gum, Griffin, Ward, Stokes, Cormack, Thomas (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary reported that 10 meetings had been held in the year, with an average attendance of 10 members. Nine papers had been read and discussed.

SHEEP ON THE FARM.—Mr. Wallis read a paper on this subject, and claimed that every farmer in the district should keep some sheep. With properly fenced paddocks they did not entail much labor, and the direct returns were far greater than the expense. The value of sheep in keeping the land clean and enriching the soil was emphasized, and also the benefit of having a supply of fresh mutton on the farm. For wool he preferred the Merino sheep, although some of the crossbreds ran very close. For lamb-raising he considered the Merino ewe crossed with the Shropshire ram to be the best breed. Figures were given to show the direct monetary return which might be expected from 100 ewes on an average farm.

Arden Vale and Wyacca, July 5.

(Average annual rainfall, 16in.)

PRESENT—Messrs. M. Eckert (chair), A. Eckert, E. and W. Klingberg, O. and P. Hanne-man, Paynter, Williss, Semmens, Pearce (Hon. Sec.), and several visitors.

ANNUAL REPORT.—The Hon. Secretary reported that eight meetings had been held during the year, with an average attendance of 12 members. There were now 24 on the roll. The outlook for producers in this district was never brighter than now.

STOATS AND WEASELS.—The Chairman wished to have the members' opinion on the question of introducing these animals for the destruction of rabbits. Members were strongly opposed to the idea, and considered that quite enough pests had already been imported. With the wire-netting round the farms the rabbit pest could easily be coped with on the smaller holdings.

Carrietton, July 10.

(Average annual rainfall, 11½in.)

PRESENT—Messrs. Gleeson (chair), Ormiston, Williams, C. T. and J. F. Fisher, Fuller, Kaerger, Cogan, and Bock (Hon. Sec.).

DAIRYING.—The Hon. Secretary read correspondence in reference to purchase of bulls of good strains with a view to improving the type of cattle in the district. Mr. Gleeson decided to obtain a Shorthorn bull calf, and Mr. Williams a Hereford. Appreciation was expressed by members of the enterprise of Messrs. Gleeson and Williams.

PHOSPHORUS POISONING.—Mr. Cogan reported that one of his steers having eaten phosphorised baits, he gave it a couple of handfuls of washing soda dissolved in hot water, with satisfactory results.

GOOD CROP.—In reply to question Messrs. Fisher and Kaerger said the paddock referred to in April *Journal* was situated near Eurelia. It was fallowed land, and received about 3in. of rain in March. The land had been grazed with horses and cattle for 17 years previously. Federation wheat was sown without manure, and from 18 acres 20 large and 116 small bags of wheat were reaped, equal to, say, 428bush. in all.

Coomooree, July 5.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Berryman (chair), J. and Jer. Brown, Ward, C. and E. Brice, Toholke, Avery, Phillis, Hall, and Kildea (Hon. Sec.).

WATER ON THE FARM.—Mr. Avery read a paper on this subject to the following effect:—As a water supply was necessary to a farm before anything could be accomplished, it behoved every farmer to do his best to secure one, and, if possible, a permanent one. Dams were very good, if there was a suitable site for one—a good catchment, and good holding clay; but on some farms it was impossible to get these requisites. The best dams went dry sometimes, although several on a farm were of great value, even though they held for only part of the year. Underground tanks were costly, and usually inadequate. He was of opinion that a good well was the most reliable means of water supply. On some farms water was not always readily obtainable by well-sinking; but cases had come under notice where it had been struck in very unlikely-looking places with the aid of a divining rod. It did not always follow that deep sinking would be necessary on high-lying country, as usually natural springs were found in the hills. After sinking a well and obtaining water, the next question which arose was as to how get it to the surface. It could be raised by horse-power or man-power; but the means which he considered the best when the water was required only for stock purposes was the windmill and pump. The wind provided cheap power, and the state of perfection to which makers had brought the appliances, and the low price at which they were sold, made them well worthy of installation. Most windmills were automatic—starting and stopping as the water in the storage tank rose or fell. With a good mill, powerful enough for the depth of the well, a tank holding, say, 2,000galls. should be large enough for requirements on the average farm in this district. Troughs should be fitted with ball taps, to insure the supply always keeping up. Stock did better and on less feed in the summer time if a good supply of pure water was available, and he considered usually did better with spring than rain water. Mr. Brice pointed out that stock did not always do best on well water; it depended on the nature of the pasture. On saltbush country they did better on fresh water. Mr. J. Brown did not agree that windmills were the best means of hauling water; in calm weather there were difficulties. But it was pointed out that by storing water this difficulty could be overcome. Mr. Jer. Brown thought that water exposed to the sun was not so good as that drawn from underground. In regard to the whip method of raising water, although the stock got a fresh drink by the whip, the water had to be hauled every time it was required. A mill could be purchased for about £30, while tackle for the whip would cost about £5, but the labor entailed would soon amount to the price of a mill. Sometimes horses refused to drink, and thus lost considerable condition. This was thought to be due to the water being exposed to the sun.

STOCK COMPLAINT.—One of the members wished to know what could be done for a mare with a humorous udder. Her foal had been weaned about three months when the running began. Hot fomentations, purging with salt, and applications of carbolic acid were recommended. [Vet.-Surgeon Desmond says that this is mammritis, and the udder should be irrigated with a hot solution of boracic acid. The use of salts in a case of this character is dangerous.—ED.]

Cradock, July 3.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. J. H. Lindo (chair), Hilder, Symons, Paterson, McAuley, Glasson, Clarke, Fitzgerald, H. Lindo, Finch, Jagoe, Gillick, Solly, Martin, Adams, Richards (Hon. Sec.), and 30 visitors.

SHEEP-BREEDING AND HANDLING OF WOOL.—The meeting was held at the homestead of Mr. J. H. Lindo, and took the form of an address from the Wool Expert. Some sheep provided by Mr. Lindo were shorn during the afternoon, and by practical demonstration and with the aid of a blackboard the points of the address were illustrated. Mr. Mathews said that in this district sheepfarmers were concerned with the production of wool rather than export lambs, and the quality of that wool was of supreme importance. Technical terms used in the wool trade were explained, and the method of calculating the value of the wool. Skirting and classing of fleeces was demonstrated, and a lot of other information given. At the close of the afternoon's demonstration, refreshments, provided by Mr. and Mrs. Lindo, were partaken of. In the evening Mr. Mathews lectured in the Cradock Institute before a large audience, and spoke upon various types of sheep. He considered the large-framed Merino the best sheep for the district. Wool of the finer type could only

be grown at the cost of sacrificing the size of the carcass. He therefore recommended the big sheep which grew a strong, serviceable wool. There was a good demand for that type of wool, and if any sheep were required for killing or market they were of good size and weight. The lecture was illustrated by lantern views, and a great many questions were put to and answered by the lecturer.

Davenport, June 17.

(Average annual rainfall, 9in.)

PRESENT—Messrs. Bothwell (chair), Gosden, Roberts, Holdsworth, Messenger, Bice, Rogers, and Lecky (Hon. Sec.).

FEATHERED THIEVES.—Mr. N. Rogers read a paper on this subject to the following effect:—Those engaged in the business of fruit-growing know full well that while Nature often gives an abundance—trees and vines yielding abundantly—Nature also produces mouths, the owners of which seem determined to fill them at the fruitgrowers' expense. These feathered thieves are many, and as varied in tastes as in size and color. The ringneck parrot makes its appearance almost as soon as the loquat forms, and as soon as the stone or seed becomes firm the bird will stand on the bunch, bite off the pulp or eatable portion, nibble the end or stone, and drop it, and will continue this work until the best fruit is gone. Then as soon as the almond is formed they make their attack on that. As the kernel hardens, the difficulty to keep them away increases, as they are more determined to have the nut. They attack apples, pears, quinces, and peaches, but these they nibble on one side of the fruit and bite the branch almost off and leave the fruit just hanging. The crow is a real daring thief, as he not only steals and eats, but carries away. This thief has wonderful powers of adaptation. No fruit seems to be distasteful or to disagree with his digestive organs. He takes the best first, and continues until the whole is gone. As soon as the loquat starts to color, the crow picks the ripening fruit one by one off the bunch. The fig is his special delight. This fruit he eats, if ripe; if not, he will try it and pass on. The report of a gun will frighten them for a time, but if they find you are not a good shot they will take very little notice—just rise up, and in a few minutes on the trees again. Softshell almonds the crow enjoys. These they crack, and take out the kernel. Apricots, tomatoes, and grapes are as sweetness to his palate. The minah or silver-eye is a grey bird with long beak and keen eye. There are two—one large, the other small. This bird (or birds) puncture the ripe fruit, such as apricots and figs, so that when the fruit is gathered it is found that not much but the skin remains. This bird is difficult to cope with, as it is afraid of nothing. If one is shot the others step to the next branch and titter as if to say “You cannot hit me.” The sparrow seems to prosper in bad seasons as in good seasons—a thief of wonderful daring. If frightened away it will return in a very short time. This thief is more for apricots and grapes; sucks out the juice, leaving the skin and stone. The starling is a comparatively recent feathered thief. A few years ago he was heard of, but not seen. I remember eight years ago seeing a few in the fruit season; but the following season they came in flocks, and have come to stay. They attack loquats, apricots, and grapes. As soon as the loquat and apricot ripens the bird knows it. In a comparatively short time the tree is cleared of all fruit, and the stones are under the trees. Whole vines are cleared in a day. In dealing with this thief one must always be on the spot, as the birds return as quickly as they go. To deal with this kind of thief is a question that is causing considerable thought. Various and numerous suggestions have been thrown out, but none seem to meet the case. It would be a good subject for discussion at the September Bureau Congress, as from such a number of practical men there would probably be some practical scheme suggested. Paper was well discussed, and various suggestions made for dealing with the birds which, it was unanimously agreed, were a source of much worry and loss to the fruitgrower.

Dawson, July 5.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. Renton (chair), Ferguson, Smart, Davies, Warner, Nottle, Jas., J., and W. A. Wilson, Baker, Meyers (Hon. Sec.), and several visitors.

ROLLING v. HARROWING CROPS.—After some discussion it was decided that harrowing crops when well rooted and when the ground was damp was most beneficial. Sharp harrows should be used.

FALLOWING.—MR. Fergusson introduced this subject, and a general discussion ensued. The general opinion was that fallowing should not be deeper than 4in. in this district. Too much ground had been spoiled by deep ploughing. Ploughs of three or four furrows, cutting not more than 8in., were considered to be best, as larger ploughs made hard work in uneven ground, and were difficult to work when ploughing in heavy stubble.

Johnsbury, July 3.

(Average annual rainfall, 9½in.)

PRESENT—MESSRS. READ (chair), DUNN, KING, HOLLETT, MASTERS, BROOK, AND CHALMERS (HON. SEC.).

CASTRATION AND BRANDING OF STOCK.—MR. BROOK read a paper on this subject to the following effect:—"In recent years a new practice had been adopted in tailing lambs by means of fire-irons. After two seasons' trial he felt confident that this new plan of taking off the tail was far worse for the lambs, and a lot more trouble for those who had to do the work. A fire-drum was needed close at hand, taking a lot of attention to keep the irons at the necessary heat. It had been claimed that burning or searing off the tail stopped the bleeding, and the lamb did not suffer from the loss of blood. This was, doubtless, true, but the lamb was put to torture by burning, the wound took very much longer to heal, and caused the tail to swell. It was also more likely to be flyblown, owing to the hard scab caused by the burn, behind which the maggot found a refuge. He was quite sure that a cut from a sharp knife was far to be preferred to a burn, and all knew which took the longer to heal and was more painful. Quite a number of the lambs cried out while the tail was being burnt off, a thing that never happened when being cut off. For marking calves he thought it a good plan to earmark. This could be done when they were very young. An earmark could be obtained for a few shillings, of almost any design desired. He favored this way of marking because it could always be seen, while at certain seasons of the year long rough hair made it difficult to tell what a brand was, no matter how well put on. When branding was resorted to great care should be taken not to burn too deeply, as that would cause a blotch, and be bad for the animal. For anyone not having a crush-pen, the circle rope around the body was best, both for branding and castrating, as it did not knock the beast about, but held it down securely, and the legs did not need tying. In castrating, the operation should be done quickly with good instruments, and a little Stockholm tar should be put on the wound to keep the flies off and assist the healing. He favored the use of the emasculator for colts. It did away with searing, &c., which often caused swelling, and if not used with great care, led to blood-poisoning. A number of valuable colts were lost through carelessness and unskilled operators. If anyone had colts to castrate it would be wise to get a thoroughly experienced man to do it; although it might cost a little more, in the long run it would be far the best." A good discussion followed, in which members agreed that the use of the emasculator was a great improvement on the old plan.

Quorn, July 3.

(Average annual rainfall, 13½in.)

PRESENT—MESSRS. THOMPSON (chair), NOLL, COOK, MCCOLL, SALMON, BREWSTER, SCHULZE, MATTNER, PATTEN (HON. SEC.), AND ONE VISITOR.

GRASS LANDS.—MR. BREWSTER read a short paper on the question of cultivation of grass lands. He considered that a great deal of the land in the district would be capable of carrying three times the stock that it now supported if it were cultivated. In its virgin state a great deal of the grass land was too stony and hard to allow the rain to soak in. Mr. COOK considered that land had to be continually cultivated and grasses be sown to get the best returns for grazing purposes. Messrs. SALMON and MCCOLL found that the natural grass would carry stock where it would not do so after cultivation. There was no doubt that by using fertilisers a larger quantity of feed was obtained. MR. NOLL thought it a mistake to cultivate for feed on the plain, as it sometimes led to a drift. He found feed to grow very quickly around bare patches after about ½in. of rain. MR. GEBERDT considered porcupine land was improved for grazing purposes by being cultivated.

Wirrabara, July 3.

(Average annual rainfall, 30in.)

PRESENT—Messrs. P. Lawson (chair), H. and A. Woodlands, Lomman, Curnow, Hollett, R. and F. Passow, W., H., and E. J. Stevens, Hunt, Marner, Hoskins, H. Lawson (Hon. Sec.), and three visitors.

EXTERMINATION OF FOXES.—Mr. R. Passow read a paper on the subject of foxes and the many ways in which they were troubling the farmers. For poisoning he recommended shooting some parrots, which should be carried home on a piece of wire or stick and then have strychnine inserted in a hole in the side. The baits must not be handled, but singeing them over a flame would make them more attractive to Reynard. They should be placed in likely places, such as the bed of a watercourse, or on the top of a ridge. A method of poisoning which had been very successful with dingoes, he considered might well be tried for foxes, viz., a bullock's horn was filled with fat treated with strychnine. The horn was then burned sufficiently to give it a strong smell and laid as a bait. The dogs would lick the fat out of the horn, and as many as 10 had been found dead near one bait. He suggested that the district council of Port Germein be asked to impose a light tax on all land and stock owners in the district to raise money for paying, say, 10s. per skin or scalp of foxes and dingoes. After discussion it was decided to ask the Advisory Board to ascertain the feeling of all branches as to making it compulsory for district councils to do something on the lines advocated by Mr. Passow. [Will members of Branches please discuss this matter.—Ed.]

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, June 28.

PRESENT—Messrs. Fradd (chair), A. and F. Bartrum, Joyce, J. and J. A. Ryan, Jacobi, Curton, Burton (Hon. Sec.), and one visitor.

ANNUAL REPORT.—The Hon. Secretary read the fourth annual report, which showed that 11 meetings had been held, with an average attendance of over eight. Eight papers had been read, and the interest in the work of the branch had increased during the period under review.

FARMING ON 200 ACRES.—Mr. J. J. Ryan read a paper on how to profitably work a small farm, to the following effect:—The land fit for cultivation should be divided into two paddocks, and well fenced. One paddock should be under crop and the other fallowed each year, utilising every acre that was fit for cultivation. The remaining land should be thoroughly cleared of bushes, &c., to procure the maximum quantity of feed. Timber should be left, as it provided shelter for stock and could be cut as needed for firewood, &c. Six good draught horses and one of lighter breed would be sufficient to keep, and three or four cows for the needs of the farm. Dairying did not pay in this district, and in the winter months the few cows kept for home supplies needed some such feed as chaff and bran. Horses should never be allowed to get low in condition. They required a good, warm stable, and regular feeding with chaff and oats, and a bran mash occasionally. Seeding should be completed by the end of May at the latest. Fallowing should be commenced as soon as possible after seeding, and the land should be worked well during the spring to kill all the weeds. Suitable wheats for the district were "Federation," "Yandilla King," and "Marshall's No. 3," the two latter being recommended for hay. Algerian oats were also excellent for hay, but must not be cut too green. Green fodder should be grown, and for this barley did remarkably well on fallow land. If possible, a few sheep should be kept for the meat supply, and they would also keep the fallow clean. It would pay to keep a few good breeds of poultry, provided a little care and attention was given. In this district, where they had a good rainfall, every farmer should have a vegetable and fruit garden, and with very little cost a good supply of fruit and vegetables could be obtained. A good discussion followed, and the paper met with general favor. Members considered, however, that it would be best to divide the farm into four or five paddocks, and that keeping sheep on small holdings in this district was not advisable.

Brinkworth, June 8.

(Average annual rainfall, 14 $\frac{1}{2}$ in.)

PRESENT—Messrs. Davis (chair), Brinkworth, Wooldridge, Ottens, Heinjus, Kreig, Green, Hill (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year 10 meetings had been held : four practical papers had been read and discussed ; and the meetings well attended. The membership had increased considerably during the year by the addition of several young farmers, who were taking active interest in the meetings.

FEEDING OFF GROWING CROPS.—Discussion on this subject took place. Members as a whole did not look favorably on the practice, as if dry weather followed feeding off it would be detrimental to the crop, as the weeds catch up to the wheat and considerably lessen the returns. Harrowing the crop after it is well rooted was recommended, members having had good results from the operation.

TREE-PLANTING.—At previous meeting a paper on this subject was read by Mr. E. J. Nettle to the following effect:—As one travels over most districts of South Australia he is forcibly impressed by the fact that the forests are noticeable by their absence. Great bare plains succeed each other with monotonous regularity, and the necessity of some means of supplying these waste places with trees is forced on the most casual observer. Arbor Day, as most of us know, means "tree day," and is so named because it is set apart for planting trees. But why should we plant trees? To answer this is the object of this paper. On one of our hot, scorching summer days, with no shelter near, we should have no difficulty in persuading any number of people who might be gathered there of the value of shade. All would be unanimous in declaring in favor of the wide-spreading leafy tree. Animals, like human beings, prefer the shade in hot days. It is little short of cruelty to allow stock to wander during some of our hot summer days without shelter of some kind. Sheep try to obtain a little shade by placing the head under the body of the next, and so on in regular order. These animals utilise the bodies of others to provide shade. Ought we not to help them by providing or reserving clumps of trees? Homesteads built in shelter of belts of trees are protected from hot, scorching winds of summer and the piercing, cold winds of winter. Stock that are depastured in sheltered paddocks keep their condition on a moderate supply of food, while it is difficult for them to maintain their condition on abundance of food on an unsheltered run. The farmer, too, would benefit by planting or reserving a ring of trees round his paddocks. These trees would break the hot winds of summer, and prevent in great measure the threshing out of heads. In winter they would tend to restrain the ill-effects of frost. There is ample scope for planting trees for ornamentation in South Australia. In our northern areas, for instance, Thirty years ago many of them were absolutely devoid of trees; but now, instead of a few residences on a bare plain, numerous groves of trees are to be seen. Pre-eminently among these towns stands Jamestown, which owes its beauty solely to a vigorous policy of tree-planting. Right through the town, and all round it, fine groves of gums meet the eye. Another important reason why we should plant trees is that the timber supplies of the world are rapidly decreasing. It was thought that other substances would take the place of timber; but, instead, it has been found that not only is more timber required in those trades that use timber, but it is used in industries previously unthought of. As timber is used in so many industries, and as we are all indebted to the benefits derived from forests, we can only rightly repay our obligations each and all of us by planting trees, or assisting others to plant them. It is said that for every pine a man cuts down in Sweden he must plant three. Another reason why we should preserve our forests and seek to extend them is that they have a marked effect on the rainfall and climate.

Brinkworth, July 13.

(Average annual rainfall, 14 $\frac{1}{2}$ in.)

PRESENT—Messrs. Davis (chair), Brinkworth, Ottens, Stott, Wundke, Hill (Hon. Sec.), and two visitors.

CULTIVATION AND SOWING.—Discussion on this question was initiated by Mr. Brinkworth, who advocated summer fallowing and harrowing down, followed by cultivating well during the winter, and again harrowing to a fine tilth in September to conserve the moisture during the summer months. He favored shallow ploughing, about 3in. to 4in., and believed in drilling in the seed shallow, so that it would germinate with the first light rain. Deep drilling often resulted in the moisture being unable to reach the seedbed, and the grain was liable to lie in the ground and malt. He also advocated harrowing after drilling to level the surface of the soil and cover any seed that was exposed. Mr.

B. Davis favored deep drilling when the ground was dry, so that light rains should not affect the seed so much; but the general opinion of members was in favor of shallow drilling for this district. Mr. John Davis considered that the depth of sowing depended largely upon the nature of the soil. A clay soil should not be worked very fine, as it was liable to cake and make it necessary to plough again in wet weather.

BUREAU WORK.—Mr. Jno. Davis also spoke of the benefits accruing to the district from the Bureau.

Caltowie, July 5.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. F. Neate (chair), Hewett, Pitatz, Kitson, S. and C. Williams, Amey, Collins, Graham, J. and F. Lehmann (Hon. Sec.).

SMUT IN WHEAT.—Mr. H. A. Graham read a paper on this subject as follows:—It was of prime importance to remember, in connection with smut, that wheat was only affected in the germinating stage, just as the young plant commenced to grow from the seed when still beneath the surface of the soil. Consequently no infection could come through the air, but the spores adhering to the seed before sowing produced the disease. The farmer saw, or fancied he saw, smut spores on his fences, and when, after treating the seed in an indifferent fashion, smut appeared, he thought it was blown from the fence. When the plant was above ground it was proof from infection from smut spores, and the man instanced could only blame the careless treatment of the seed. It was important to remember that the smuts of wheat, oats, and barley were quite distinct from each other, and the smut of any one of these cereals could not affect either of the other two. As smut was reproduced from spores it was evident that if the spores were destroyed the smut itself would not appear. Every farmer knew that some varieties of wheat were more liable to infection by smut than others, therefore they should take every precaution in pickling these varieties. They should also have a cement-lined stone or concrete pit for pickling the seed. A handy man could construct one at a small cost. It should be at least 3ft. 9in. long by 2ft. wide, with a depth of 2ft. The edges or collar should extend 2ft. 6in. all round, with an incline of 6in. This allowed for all surplus pickle to run back into the pit while the bags were standing on the collar. Care should be taken not to have the bags too full, or they might burst when dipped. One man, with the aid of pulleys or lever, could pickle more seed in a given time than two men could under the old system with tub or barrel. As soon as he removed the first bag from the pit it would stand on the collar to drain, and in would go another. With a pit of the size described from 12 to 15 bags of seed could be pickled before taking away the first one. A good discussion followed, members generally agreeing with the writer. Members wished to know whether smut attacked other grains than oats, barley, and wheat. [See paragraph in "Points for Producers" this issue.—ED.]

Crystal Brook, July 24.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Kelly (chair), Sargent, Forder, Wood, Miell, Forgan, Hutchison, Cowled, Davidson, Venning, Morrish, Carmichael, Burton, Clarke, Shaw, Pavay, Weston (Hon. Sec.), and one visitor.

AUTUMN AND WINTER FEED FOR STOCK.—Mr. Forder read a paper on this subject as follows:—"The greatest problem stockowners had to solve was the provision of food to keep their stock in good condition through the autumn and winter months. The best of the dry grass and stubble had gone by the end of February, and stock began to fall off in condition and needed something more than they could pick up in the paddock. If farmers could get a large and cheap supply of food for this time of the year stockraising would become more profitable. There were two ways of providing this supply. First by growing early feed; second by preserving the previous season's crop. He would suggest that a farmer who went in for lamb-raising should in March sow about 50 acres of what was to be his grass paddock with Cape oats or rye, putting on about 50lbs of super. per acre. All grass, wild oats, &c., would come up with the seed that was sown after the first rain, and would soon make good feed. He preferred rye to oats, because it grew faster and stooled out better. Growing green feed was not all that was needed, because they could not depend on having early rains. It was necessary to preserve some of the previous season's crop, and he preferred ensilage to hay. An acre of crop that would go

2 tons of hay to the acre would yield 10 tons of green stuff, and that made into ensilage would be the same weight when ready for use, as nothing was lost while in the pit. A given weight of ensilage would feed as much stock as the same weight of hay [Query—Ed.]; therefore an acre of crop cut for ensilage would yield five times as much as it would if cut for hay. Anything that would produce a thick crop would do to grow, such as wheat and Cape oats mixed, wild oats, barley grass, &c., for ensilage, or a patch of crop that was dirty with mustard would come in very well. The crop should be cut when it was in full bloom and put into the pit as soon as possible after cutting up, only cutting as much of the crop each morning as could be carted and chaffed into the silo. This must be well tramped into the silo, and when full it should be left a couple of days to sink, then it would be filled up again and left to sink again; after filling the third time to be covered over with old bags and about 6in. of dirt thrown on the bags. The ensilage would be ready for use in three months. For a pit he would suggest building one of stone 6ft. underground and 6ft. above ground and 12ft. square, with a door above ground for getting the ensilage out. This sized pit would be large enough for the average farmer, as it would hold about 64 tons. The pit should be handy to the chaff-eutter, so that the stuff could be run up with an elevator, and a great deal of handling be saved. Cattle would thrive on 25lbs. of ensilage per day, and 10 head of cows could be kept for six months on the produce of two acres, with the aid of the feed that could be picked up in the paddocks. Ensilage did not taint the milk or butter, but on the contrary, tended to improve it. Sheep did well on 1bs. of ensilage per day; 280 ewes would eat half a ton a day, and the produce of six acres would keep them four months. The method of feeding them was very simple. The ensilage was put into wooden troughs, which were placed in a small paddock and the sheep were brought in every morning and fed. Sheep that were so fed did not fall off in condition, and were always ready for sale as fats as soon as wanted. Ewes could be depended on to rear early lambs, as they would always have plenty of milk. Ensilage would keep for a number of years and could always be relied upon as a food supply if put in carefully."

Georgetown, July 3.

(Average annual rainfall, 18in.)

PRESENT—Messrs. King (chair), McCauley, P. and J. Higgins, Fogarty, Myatt, Smallcombe, Bond, Noonan, Thomson, M. and G. Hill, McDonald, Freebairn, Page, and Eyre (Hon. Sec.).

SHEEP ON THE FARM.—Mr. Noonan read a paper on this subject as follows:—That sheep are profitable to the farmer has been proved beyond doubt. They give quicker returns than any other animal he can rear. The Merino is the most suitable type for the farmer in this district, being profitable and of hardy constitution. The main thing is the selection of good Merino rams and large-framed Merino ewes. The middle of April would probably be quite early enough for lambing, as by that time there is generally plenty of green feed. The carrying capacity of the farm for sheep is very often overestimated by the farmer. It would be far more profitable to keep less sheep, so that they would have sufficient feed and make more wool or mutton. Small paddocks are more suitable for sheep than large ones, as if they are too large the sheep are constantly travelling over their feed. The small paddocks admit of the sheep being moved from time to time on to fresh feed, and so improves their condition. It is well known that sheep never do well if left in one place for any length of time. As regards wool-growing, we should strive to keep our flocks pure, as once the cross gets into the wool it becomes less valuable. This trouble can be overcome by marking off the cross-wool sheep for mutton. Late lambs produce more wool than early ones, but the following year the early-bred ones give better results. Discussion followed, in which members generally agreed with the views expressed in the paper.

Mount Bryan, July 5.

(Average annual rainfall, 15½in.)

PRESENT—Messrs. Hatherly (chair), Kelly, Caldecott, Wardle, Thomas, Hand, E. K. Collins, Dunstan, Nutt, Beckwith, Hoffmann, Gregurke, Schmidt, F. and J. Price, A. Collins (Hon. Sec.), and several visitors.

WOOL-CLASSING.—Mr. J. Hatherly read a paper on this subject to the following effect:—The object of wool-classing is to pack the wool in such a way that the grower will get the best possible price. The wool should be packed so that the buyer will be able to get

what he wants without being compelled to take that which he does not require, thus creating competition. It must be packed so that the buyer will be able to get at as near as possible the true value of the wool, and so that when the bales are opened in the market the wool will look attractive. Should these points be kept in view the buyer will have confidence in valuing the wool. It should be borne in mind that all sheep do not grow wool of the same type or value, and when it is known that all manufacturers do not require the same class of wool the necessity for a little attention to this matter must be admitted. As soon as the shearer has taken the fleece off the sheep, a boy whose business it is to pick up the fleece catches it by the hindquarters and places it on a rolling table with the wool side uppermost; the wool rollers then proceed to skirt the fleece, and then roll it up. This is done by folding in the two edges and rolling up from the breech to the neck. The idea kept in view by the rollers is to roll it in such a way that the best portion shall be shown. The fleece is then carried to the wool-classing table. The amount of skirting taken off is decided by the classer who is in charge of the whole work. At the same time as the skirting and rolling the work of piece-sorting is carried on; thus the pieces which have been thrown down by the skirters are picked up and carried to a separate table, where they are divided or sorted into as many sorts and in such a way as the wool-classer shall direct. As soon as there are sufficient number of pieces on the table they are divided into a given number of sorts, being guided in this respect by local conditions—such as the number shorn and the locality in which they are kept. The belly wool, being shorn separate, as well as the locks from the legs, head, and face, are dealt with by the piece picker under instructions from the wool-classer. The main lines on which the Merino wool is classed are—first and most important, condition, length, and soundness of staple. Color has also its place, while any very coarse wool is kept out. The reason why condition occupies the chief place is due to the fact that in any well-regulated flock, where culling has been carried on, the quality of the wool is comparatively uniform; and seeing that wool is bought on its clean value it is evident that the light-condition wool must be kept separate from the heavy condition. The reason why length and soundness of staple is also taken into consideration is on account of the fact that some buyers prefer the longer sound wool, whereas other buyers are not so particular in this respect. If the discolored fleeces are kept by themselves the value of the clip, on the whole, is better, and the bulk of the wool presents a much more attractive appearance. If culling were carried on—even on small places—every year there would not be near so much work in classing, as the fleeces would be more even in type, not only in the ewes and wethers, but the rams also.

Mount Bryan East, July 24.

(Average annual rainfall, 15 $\frac{1}{2}$ in.)

PRESENT—Messrs. J. Thomas, jun. (chair), Wilkins, Quinn, Tralaggan, Gare, Tedely, Doyle, Wilks, and R. Thomas (Hon. Sec.).

STANDARD CORNSACK.—Discussion on the subject of the Chapman sack took place. Members were unanimous in the opinion that these bags were too small. They considered that they should be about 2in. wider, as a number of the bags would not hold 200lbs. wheat.

CARE OF FARM HORSES.—Mr. Wilkins read a paper on this subject. For moist districts he preferred a team of active draughts, but where the soil was loose and easy to work, a lighter stamp of animal would be preferable. He would feed working horses with chaff in preference to hay at all times, and the value of oats in addition could hardly be over estimated. He found that a horse given 5lbs. oats and a moderate supply of chaff, say 30lbs. to 35lbs., would do more work than an animal given extra chaff and hay and less oats. Each horse should have its own stall and feed box, so that all would get their due proportion of food. This was absolutely essential if the animals were to be kept in good condition and to do the best work. In the early spring a supply of green feed would serve as an excellent tonic for the horses. The importance of well-fitting collars and hames was treated at some length. It did not necessarily follow that because a horse's shoulders were sound that his collar fitted well, as some animals had very tough skins; but if the best work was to be got out of him the collar must fit well, and the hames fit well on the collar. The shoulders of newly-broke horses required careful attention. Many a good animal had been made a jibber or a bad starter through neglect of this. Chains should be of even lengths, swings well balanced and sufficiently wide to allow the horse to work in comfort without getting chafed. Horses should be thoroughly groomed at least once a day, should have a good driver, and it was better to add more oats to the feed if more pace was desired, rather than to use the whip. In regard to the extra-free

horse, the pace of the team should not be made to suit this animal, but he should be held-back with the others. A good way to do this was to have a short strap under the chin, with the ends fastened to the bit ring; a ring was slipped on to this chin strap, and through the ring the tie back line was passed and fastened to the animal on either side of the free horse. When not in use the throat strap passed through the ring kept it up out of the way. He believed that five horses properly looked after with well-fitting harness would do more work than six animals with only the usual amount of care and attention.

Narridy, July 3.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. Darley (chair), Haren, Lang, Lehman, Nicholson, Smart, and Kelly (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that there were 17 members on the roll; that nine meetings had been held during the year, with an average attendance of nearly nine. Only one paper had been read, and several interesting discussions had taken place. Members thought the attendance should be improved and that more papers should be read.

CO-OPERATIVE MACHINE SHEARING.—In considering correspondence from a company in regard to this matter, members considered it would pay better for each farmer to shear his own sheep, and when preparing the wool for market to simply skirt off the rough, dirty pieces.

Port Broughton, July 2.

(Average annual rainfall, 14in.)

PRESENT—Messrs. Barclay (chair), Pattingale, Dalby, Hoar, Evans, Hicks, Whittaker, Harris, Excell, Pattingale (Hon. Sec.), and one visitor.

MUSTARD AND RAPE.—Mr. Dalby recommended mixing seed with bonedust and placing it in the bottom of the drill; any additional super. could be put on the top of the bonedust. All the seed so mixed should be sown on the same day, as if it is left it would be liable to moult. The seed should be sown as shallow as possible. Many members were growing mustard and rape for fattening lambs, &c. They considered these feeds to be better than oats.

Port Germein, July 3.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Carmichael (chair), Holman, Deer, Crittenden, Hillam, Blesing (Hon. Sec.) and one visitor.

LAMB-RAISING AND WHEAT-GROWING.—Mr. Holman read extracts from a lecture by Professor Lowrie (formerly Principal of Roseworthy College) dealing with this matter, in which he advocated heavy dressings of phosphatic manures. A long discussion followed, in which all the members who had used phosphates were agreed that it paid to use these fertilisers. Mr. Crittenden maintained that the lands in Baroota did not require fertilisers. So long as there was a good rainfall and the land was well worked they could grow as good a crop as with fertilisers. He cropped 600 acres every year out of 900 acres, and considered his yields equal to, if not better than, those who use fertilisers. Mr. Hillam contended that everyone had not land like that belonging to Mr. Crittenden. He himself had proved the need for manures, both for wheat and fodder, and the time would come when Mr. Crittenden would have to use fertilisers also. Mr. Carmichael said that if he did not use fertilisers he would have very little feed in his stubble paddocks. The extra feed alone was quite sufficient to pay for the fertilisers, apart from the increased yield in crops.

Whyte-Yarcowie, July 3.

(Average annual rainfall, 13½in.)

PRESENT—Messrs. Pearce (chair), Mudge, Ward, Jenkins, McCann, Pascoe, McLeod, W. G. and F. H. Lock (Hon. Sec.).

NOXIOUS WEEDS.—Following on the reading of an extract from the *Journal*, the question of noxious weeds was discussed. Members considered that weeds were allowed

to get too great a hold before being stigmatised as "noxious." The "wild onion" was quoted as an instance of the way in which a weed originally planted as a garden flower had got away and for years was allowed to spread without any serious attempt being made to eradicate it or brand it as a noxious weed. On one farm in this district this weed had now such a hold that it was almost impossible to get rid of it. Mr. Pascoe, while in Melbourne recently, had visited the Department of Agriculture there, and noticed that on the walls of the office samples of all noxious weeds known in Victoria were displayed. He considered this plan worthy of adoption here, as it enabled farmers to see these plants and recognise any weed on his own land before it became such a big contract to get free from it.

HORSE DISEASE.—Mr. G. F. Jenkins described the symptoms of a complaint which had affected nearly all his father's horses. Two valuable animals had to be destroyed, and a third was still very ill. There was nothing to show that the animals were unwell. They ate and drank well, their coats were not rough, and to all appearances were in good health, but when worked they would tremble at the knees, and after lying down were unable to rise without assistance. A hard, dry cough was present, and swelling in the chest and front legs. Medicines had been provided by Inspector Williams which, after a time seemed to be having a good effect. The Inspector attributed the trouble to working the horses before they had thoroughly recovered from the effects of influenza.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, July 3.

(Average annual rainfall, 21 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Ball (chair), Friend, Player, Waters, Plush, Roberts, Sibley, Wishart, Smith, Salter, Swann, Matthews (Hon. Sec.), and two visitors.

COOL CHAMBER FOR DISTRICT.—Mr. Swann introduced this matter for discussion. He considered that a refrigerating plant in the district would be of great service to producers, and instanced the case of apricots rapidly ripening and getting ahead of the factories. The surplus might be placed in cool storage and taken out as required, and thus a big saving of what was now waste would be effected. Fruit would carry much better after cooling, and a rush might often be avoided in shipping. It had been found that apples that had been chilled carried better. He had an estimate from a firm for a refrigerating plant capable of treating 5,000 cases at a time, and the figure set down was £660, which did not include an engine, which would probably cost £200 more. Mr. S. Plush thought that it was a desirable move for the growers to make. The business had been undertaken in the other States by private concerns, and also by the various Governments. He pointed out the gain that would probably accrue by the storage of Duchess pears in holding for the markets. He considered that such an undertaking as cool storage would be a success in this district. Mr. C. L. Wishart said he had sent a trial lot to Port Adelaide for storage, and after they had been in for some time he saw them and found that a considerable shrinkage had taken place, although the fruit was generally good. The price realised after paying expenses was only an average one. Mr. Fulton Salter was afraid that the cost would be prohibitive, and thought it would be better for them to make more experiments in the existing establishments before launching out themselves. Mr. S. O. Smith said he had learned that one large orchardist firm in New South Wales had erected a plant of their own. He thought the idea a good one, and would mean a saving to growers. Mr. W. Sibley considered it probable that when the railway was established two or three more preserving and canning factories would start, and these would take up the surplus fruit. The Chairman pointed out that the undertaking might prove commercially a profitable concern by the sale of ice in the district.

MANURING VINEYARDS.—Mr. Fulton Salter referred to his experiments. The results had not been as good as he had expected, although he admitted that he had had very good crops and possibly that the coming season might show the greater benefit derived from the application. A short general discussion then took place, in which most of the members joined.

Balaklava, June 12.

(Average annual rainfall, 15½in.)

PRESENT—Messrs. Neville (chair), Roediger, Goldney, Thomas, Tuck, Curtis, Hoepner, Wagener, and Uppill (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that eight meetings had been held during the year, with an average attendance of over nine members. A number of valuable papers had been read and discussed, and interest in the branch had been well maintained during the year.

CHAFF ACT.—Mr. Tuck asked what steps were necessary to be taken under the Chaff Act before selling chaffed hay. [All that is required is a written intimation to the Inspector of Chaff, Department of Agriculture, Adelaide, giving name and address and whether the person selling is a cutter or retailer only.—*Ed.*]

HORSE-BREEDING.—Mr. Roediger read a paper on this subject to the following effect:—They heard a good deal about the use of motors on the farm instead of horses, but he was of opinion that it would be a long time before the horse was a thing of the past on the farm. Under present conditions of farming they had found that in order to get the best results from their land it was necessary to work it thoroughly, and to do this they must have a good strong team of horses. They must have sufficient strength to work the land at the right time and in a thorough manner, as neglect of this may easily result in loss of hundreds of pounds on the crop. For this district he favored a good-bodied, active horse, not too heavy in the leg. On other classes of land other types of horses would be better suited, and the farmer may soon find out for himself what stamp of animal will be most suitable for the work he has to do. Breeding horses on the farm is not only necessary to keep up the teams, but is also profitable, for good horses are realising high prices. In breeding it pays best to breed from the best. Many farmers seem to be anxious to breed as many foals as they can, and put all their mares to the stallion. Select the best mares—not necessarily the largest; but steady workers, and those likely to produce a good foal without much trouble at foaling. He preferred to breed from a good pedigreed stallion, if one is obtainable that will suit the type of mares to be bred from. Mares in foal require careful attention, and should be given light work to within two or three weeks of foaling. Light work will prevent them getting too fat, and will keep them in good health. The foal will also be healthier than if the mare is allowed to get fat for want of exercise. The mare needs watching when near foaling, as a little judicious attention may save the foal, and sometimes mare and foal. After the foal is born the mare requires plenty of good food. They should be put in a warm, sheltered paddock until the foal is able to get about well; then, if the feed in the ordinary paddocks is good, they can be turned out with the other horses, as the latter will not hurt the foal. When the feed begins to dry off the mare and foal will need to be stable fed, and if well-grown it may be weaned at six months old. To wean foals they should be shut away from the mares, and fed well on chaff hay with some bran and oats added. In his opinion oats were very necessary, as they formed bone and muscle. When there is sufficient feed the following season, the foals should be turned out. It must always be remembered that much of the future of the horse depends upon the feed it gets when young. They must be kept in good condition, so that they develop well. Farm horses should be broken in at 3 years old, and given light work at first. A good discussion ensued, members generally agreeing with the writer. Mr. Wagener said for a number of years he had poor luck with his foaling mares, and thought it was due to their being too fat. Mr. Tuck advocated the licensing of stallions, as he believed it would result in a better type of stallion being kept.

Balaklava, July 10.

(Average annual rainfall, 15½in.)

PRESENT—Messrs. Neville (chair), Thomas, Goldney, Roediger, Robinson, Baker, Anderson, Hoepner, Helleur, and Uppill (Hon. Sec.).

INSPECTION OF STALLIONS.—Members were agreed that the licensing of stallions was of great importance, and they considered that at the present time South Australia was being used as a dumping ground for inferior or broken-down stallions, which were unable to pass the tests in the other States.

CO-OPERATION.—Mr. Robinson considered the members should co-operate in purchasing super., cornsacks, binder-twine, &c., and felt sure that goods could be purchased at a considerable reduction in this way.

MILLET GRASS.—Mr. Helleur tabled a sample of a grass which he had found growing in the hills. He planted a root in his garden two and a half years ago; it had grown 2ft.

high, and had kept green all the summer after having been cut down three times. Stock would eat it freely. It was decided to send the plant to the Editor. [This grass is *Oryzopsis miliaceum*, a very hardy perennial of considerable value for stock.—ED.]

Gawler River, July 2.

(Average annual rainfall, 18in.)

PRESENT—Messrs. Leak (chair), Roediger, Hayman, Young, F. and A. Bray, Richter, B. and J. Hillier, Dunn, Spencer, Clements, A. M. and H. Dawkins, Winckel (Hon. Sec.), and three visitors.

SHEEP-BREEDING.—Mr. H. Dawkins addressed the meeting on various breeds of sheep. He favored the Merino for this district, and contended that although the lambs would be of rather less value than the crossbred, the extra value of the ewes' wool would more than compensate. A good discussion followed, in which members were of the same opinion as regards the suitability of the Merino sheep for the district, though some favored crossing where fat lambs were the object. Mr. Hayman had found crossbred ewes' lambs ready for market three weeks earlier than Merino.

Mallala, July 12.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. Marshman (chair), Mairn, Moody, McCabe, Jenkins, East, Temby, Griffiths, Worden, Nevin (Hon. Sec.), and two visitors.

CARE AND USE OF FARM IMPLEMENTS.—Mr. East read a paper on this subject as follows:—"One is very much surprised at the way many farmers use their machinery. In many cases they are working the machines quite contrary to the ideas of the makers. Take the plough as an illustration, and view it from the manufacturers' outlook. The first object he considers is a board that gives the best results in varied lands. After settling that point he sets the front body $\frac{3}{4}$ in. to $\frac{1}{2}$ in., leaving the back body in a straight line with the line of draught, and each intermediate body takes its particular place in between, running straight to the back body. This is bringing everything to the centre draught. In many cases where farmers are working five-furrow ploughs, they are working with one horse on the ploughing. This is quite contrary to the law by which the maker is guided in manufacturing. The moment you begin to shift the draught of the plough to suit one horse walking on the ploughed land you are getting away from the line of draught that the maker has designed and made his plough by. Then the plough begins to swing away from the land and consequently the work is not satisfactory. Then again, when the land is hard, we see many farmers dipping the bodies and finally condemning the plough, when it would take the land if set properly, that is to say, from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. dip on the share. Drills and cultivators do not require a great deal of attention, other than keeping them in good order. Many farmers have paid pounds in fittings owing to the machine being allowed to remain dirty. If dirty, it takes more driving and wears out more quickly. The drill should last the farmer a lifetime, seeing that it is a machine of very slow motion, and has no side draught such as the plough and harvester have. Binders and harvesters come next. These are, perhaps, the most complicated machines on the farm, and are above the average farmer's mechanical knowledge to manipulate for the best results. I have seen a man lose three days over a 6d. spring, and also know a farmer in the district who bought a new machine because the old one would not work for the lack of a 6d. fitting. I have bought on different occasions, machines considered to be of very little use, and put in from 10s. to £2 worth of fittings, and they are still working at every harvest. The binders are machines of many parts, and are required to be very effective. Therefore, the parts must be attended to when worn. In the experience of the writer the small landowners do not get the length of use out of the machines that the larger farmer does. The two largest landowners in the district are working the two oldest machines. This, I think, shows that many pounds a year are spent in different ways on machinery that is unnecessary. In other words, a good deal of machinery is shelved for want of knowledge. The majority of binders are built so that every part is a part in itself, and not attached to any other part, but that it can be severed and replaced without difficulty." In the discussion which followed, members agreed that mistakes were frequently made in the directions indicated. They thought,

however, that farmers were advancing in their knowledge of the practical use of complicated farm machinery, and if proper duplicates could be secured they preferred to use old machines with which they were acquainted to purchasing new ones. It was considered that farmers should keep pace with the times, and, if necessary, discard old machines and put superior ones in their places. It was pointed out that, while there were many defects in matters of detail, the neglect of proper painting and housing of implements and machinery was very regrettable. Serious losses resulted from these causes.

Nantawarra, July 7.

(Average annual rainfall, 15in.)

PRESENT—MESSRS. Smith (chair), Dixon, Sutton, J. and R. Nicholls, Greenshields, Herbert, Sleep, Gosden (Hon. Sec.), and seven visitors.

FOXES AND SPARROWS.—Mr. Sleep reported that foxes were carrying off a large percentage of his poultry. Mr. J. Nicholls recommended parrots treated with poison as baits for this pest. Mr. Sleep had also suffered loss through the damage done by sparrows. He had tried poisoned wheat, but the result was futile.

DEEP v. SHALLOW CULTIVATION.—The Chairman read a paper on this subject, as follows:—"By deep cultivation he referred to land worked to a depth of 4in. and over, and by shallow, land worked to a depth of not more than 3½in. to 4in. For years he had been a keen observer of these modes of cultivation, and claimed that in the light soil of the district shallow cultivation was more productive. Wheat required a solid bed, which shallow ploughing provided and deep cultivation did not. If land was ploughed deeply it was almost impossible with the moderate rainfall of that district to get the bottom soil down solid enough for the best germination. A few years ago he fallowed a paddock of a hundred acres 5in. deep, and afterwards worked the land well. The yield was 6bush. to the acre. The following year the same land was ploughed about 2½in. deep, and the yield 16bush. per acre. Three years ago he fallowed 95 acres of land 2½in. to 3in. deep, and just before hay harvest gave it a shallow working with the cultivator. At seeding time it was cultivated lightly and seed drilled in. A 24bush. harvest was the result. Last year two paddocks in this district with only a road dividing them were under crop. One had been fallowed only 3in. deep; it was harrowed two or three times during spring. At seeding time it was cultivated, drilled, and harrowed; harvest time showed a result of 22bush. The other paddock had been fallowed from 5in. to 6in. deep, cultivated once, and harrowed three times during spring and again harrowed twice later on. Just before seeding time it was rolled; then it was cultivated deeply, drilled in, and harrowed. The best portion of that crop yielded 18bush., the remainder 15bush. A paddock of 200 acres adjoining his farm, which had been fallowed only 2½in. to 3in. deep and worked fairly well, yielded 24bush. last year. A successful farmer in this district made a mistake in the past by working his land so deeply. He now said that shallow cultivation was giving far more satisfactory results. At present he believed that shallow cultivation in that district was more productive than deep, and not so likely to produce takeall." Mr. E. Herbert could not support all the paper contained. No hard and fast rules could be laid down. Locality, nature of soil, rainfall, &c., should be considered, and the cultivation regulated accordingly. He did not favor very deep cultivation for this district, but he considered the depth advocated by the Chairman too shallow. Soil ploughed only 2½in. to 3in. deep would have the seed deposited right on the hard bottom by the drill, and this was not the best for the young plant to thrive on. Deeply-ploughed soil held the moisture better. He believed that wheat needed a fairly firm bottom soil to germinate well on, but this condition could be secured by working it well after ploughing. Mr. R. Nicholls strongly supported the paper. He was of opinion that sufficient importance was not attached to the subject of shallow cultivation. Experiments in varying depths of cultivation should be carried out at all Government experimental farms. Perhaps they were at the College, if so, he would welcome a report on the results. The generally light nature of the soil in this district required shallow cultivation to procure the best results. This had been his experience for some time. Nature had placed the best soil on and near the surface, and it was not reasonable to turn up the poorer ground from below by deep ploughing. Shallow ploughing not only gave the best harvest, but was cheaper and quicker than deep working. This was a great consideration in these days, as to make farming pay it was necessary to get over the ground quickly. He had read that in France attention was now being paid to shallow cultivation with very encouraging results. The majority of speakers supported the Chairman's paper.

Stockport, July 5.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Megaw (chair), Stribling, Godfree, Thomas, Whitelaw, Stevens, Harnett, Laird, Perry, Bald, Mitchell, Connolly, Pycroft, Howard, Murray (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The report of the past year's work was read by the Hon. Secretary, who intimated that the year under review was the seventeenth of the Branch's existence and he had presented the report as Hon. Secretary on each occasion. The attendance during the year had been very poor.

LUCEBNE FOR COWS.—Mr. Megaw wished to know how many cows could be kept by an acre of lucerne from November to March. Mr. Whitelaw had read of eight to ten cows per acre being kept, but with irrigation at the rate of 200,000galls. to 250,000galls. of water per acre.

TRIFOLIUM SUBTERRANEUM.—Mr. Stevens tabled some seed and hay of this plant, and read extracts concerning it. Members wished to know whether this fodder was likely to become a pest, or whether it could easily be got rid of. [There is no danger of this becoming a nuisance.—ED.]

Watervale, June 28.

(Average annual rainfall, 27in.)

PRESENT—Messrs. Sobels (chair), Guthrie, Ward, Ashton, Byrne, Norris, and Duke (Hon. Sec.).

BRIDGES.—Discussion on the construction of bridges took place. The Chairman suggested arches made of reinforced concrete, instead of having central piles. Some considered the reinforced concrete too expensive, while others were of opinion that the concrete would cost less than timber.

TOBACCO-GROWING.—Mr. D. Guthrie had grown tobacco successfully, but he did not know much about curing it. A firm of tobacco-growers had offered a high price for land in Watervale for the culture of this plant when land was at a low price for other purposes. The Branch decided to obtain samples of seed and information as to growing and manufacturing of tobacco from the Department of Agriculture.

CURRENT-GROWING.—Mr. Guthrie asked for information in regard to currant-growing. The general opinion was that the vines should be planted in rows, with 12ft. between the plants and 9ft. in the rows. Only vigorous, well-rooted young vines should be planted. The Chairman quoted facts to show that low trellising was preferable to high. The members desired to have the opinion of other branches.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Arthurton, June 29.

(Average annual rainfall, 16in.).

PRESENT—Messrs. Welch (chair), Short, Crosby, Williams, Westbrook, Bull, Rowe, Lomman, Klein, and Lamshed (Hon. Sec.).

HOMESTEAD MEETING.—The meeting was held at the homestead of Mr. Welch, and among the first items of business the Hon. Secretary read the annual report. There were 15 names on the roll, and two honorary members. Eight meetings had been held, with an average attendance of eight members.

PREPARED OF SEED.—Mr. Rowe read a paper on this subject, which he claimed should be considered just at this time, for reasons set forth. The paper read much as follows:—All would agree that it would be to their financial advantage to try and place the best and cleanest wheat on the markets of the world, especially if they wished to keep up the reputation South Australian wheat had gained. The careful selection and preparation of the seed was one step in that direction. They could begin to select the various portions of the crop which were to be harvested for next year's seed as soon as the wheat was up, and in doing so select those portions that were most free from weeds

of all kinds. All knew how difficult it was to clean out the seeds of weeds from the wheat, and it was very much less labor to select the cleanest portions of the crop and mark them for seed. Without doing any serious damage, the crop could be gone through, and anything that was likely to be detrimental to the harvest could be cut up or pulled out. As harvest time approached the farmer should go through again, and cut off and let fall to the ground any foreign plant that might still be growing in the wheat or other crop. It did not take many acres to supply all the seed necessary for the next year. Having done what was possible to prepare the seed for the next year they should take a little trouble to try and harvest those portions that were selected for seed under the best possible conditions. Not on the hottest of days, when the grain was liable to crack; nor yet when it was too damp and would not thresh; but they should seize the opportunity when a good day favored them. The beaters of the harvesters or reaper should be raised so that the wheat would not be so likely to crack or to be damaged. It was also very necessary to clean the machines before starting each of the selected portions or plots. Another very important detail was to keep the varieties of seed wheat separate, and the bags branded with some letter or sign. The harvester or cleaner would not make a sample fit for seed in the first operation, so that it was necessary to clean or grade it afterwards. To do this thoroughly the cleaner or grader must be free from other sorts of wheat, and to ensure this it needed attention after treating each variety. It was a good policy to take out as much as possible of the damaged or small grain, as it could never pay to purchase fertilisers to drill in with grain that would not germinate. Care was also necessary to prevent mixing of seed in the operations of pickling, or before harvest it would be seen that all the previous labor was thrown away. Some would say such careful selection did not pay, and to a certain extent he agreed; but they should look all round this question. It might not pay in a direct way, but indirectly it would. Those who did little or nothing in the preparation of their seed like to run to a man who had taken the trouble, and buy at market rates or less for seed purposes. A lengthy discussion followed, and members indorsed the views that Mr. Rowe had expressed.

Bute, June 29.

(Average annual rainfall, 15in.)

PRESENT—Messrs. A. Cousins (chair), E. Cousins, Sharman, M. and D. McCormack, Wauchope, Heinrich, Rauth, Masters, Axford, Stevens, McArthur, Barnes, Schroeter, and Commons.

CO-OPERATIVE SHEARING.—This matter was discussed, and while members were in favor of the idea, they thought the prices quoted by a certain firm, viz., 6½d. to 7½d. per sheep, rather excessive.

ENSILAGE.—A sample of ensilage was exhibited by Mr. Masters, which had been in the silo since October. It was in excellent condition, and quite a revelation to some who had not seen ensilage previously. This silo was partly above and partly below ground, and was lined with galvanized iron. He put in oats and barley in October last, weighted down with earth. He now had about 15 tons of excellent ensilage which fully repaid him for the trouble. The horses were very fond of this fodder. A good discussion resulted, in which most members took part.

Dowlingville, July 22.

PRESENT—Messrs. Montgomery (chair), Illman, Lodge, Mason, Crowell, and Grave (Hon. Sec.).

FALLOWING SANDY LAND.—Members wished to know the best method of working sandy land to prevent drifting after fallowing, or whether some crop could be grown instead of leaving the land bare. The opinion of other branches was desired. Messrs. Lodge and Crowell favored ploughing and leaving the land rough; if worked down fine it was much more liable to drift. Members were unanimous in the opinion that it did not pay to fallow sandy land, as after a drift it was a long time before it regained its normal healthy condition.

Maitland, July 3.(Average annual rainfall, 19 $\frac{1}{2}$ in.)

PRESENT—Messrs. Lamshed (chair), Bawden, Bentley, Bowey, Heileman, Hill, Jarrett, Kelly, Lutz, Opie, Smith, and Pitcher (Hon. Sec.).

CO-OPERATIVE SHEARING.—After some lengthy discussion it was decided that there was not sufficient inducement in this district to entertain the proposition in regard to co-operative shearing made by an Adelaide firm.

GUM TREES.—Mr. Kelly wished to know whether young gum trees required protection from the weather when first planted. Members considered that they would do better if given some slight protection, such as a few stumps, or a bag supported on stakes to break the wind.

Minlaton, July 3.(Average annual rainfall, 17 $\frac{1}{2}$ in.)

PRESENT—Messrs. Bennett (chair), Vanstone, Anderson, Correll, R. and J. McKenzie (Hon. Sec.).

Poisoned Dog—Antidote.—Mr. Anderson stated that a very small piece of bluestone put down the throat of a poisoned dog had been found effective in saving the animal.

Experimental Work on the Farm.—The Hon. Secretary read a paper on this subject as follows:—"Every farmer ought to do some experimental work each year. They must not be content to rest because they were doing fairly well, thinking that they could not do better still. Scientific agricultural research was only in its infancy so far. One of the greatest problems of the future for South Australia was to find out how to produce greater returns per acre. We needed a larger population, and as the population increased land would become more scarce and holdings would become smaller. More intense cultivation would be inevitable in order that the land might carry more stock and produce. There were only two things to be done. To work the land better and feed it more. He did not mean that they should hastily put on 3cwt. of super. per acre, but that they should experiment with different quantities in various ways. Those who had early fallow should try sowing peas and plough them in when they were flowering. Then they should watch the result in the next year's crop. They would do well to try the effect of ploughing and working a piece of fallow land again and again, up to 10 or 12 times if possible. One acre worked 10 times might be as good as 10 acres worked once. He advised them to try it. They should also sow some land with a bushel and a half of seed, and some with three-quarters of a bushel, and mark carefully the result. He was convinced that it paid well to screen or grade all seed wheat. The screenings would make the best of fowl feed and the seed would be as good a sample as could be desired. If a bag or two of super. remained after sowing it should be drilled on the grass paddock, just to see the result. All the stable manure procurable should be spread on the grass and hay paddocks, and a load or two should be tried on the wheat crop. He would advise all to try the effect of harrowing the growing crop—a small portion once, another twice, and yet another plot three times. The effect of fallowing a small piece of land for two years, well worked, and then cropped might be tried. They would lose the feed, but it was worth it for the experiment.

Pine Forest, June 29.

(Average annual rainfall, 13in.)

PRESENT—Messrs. Goodridge (chair), Adams, Carman, Nelson, Inkster, R. W. Barr, and R. Barr (Hon. Sec.).

Vegetables for Farm Supplies.—Mr. Adams read a paper on this subject. A supply of vegetables could be grown on almost every farm in the district on some spot convenient to the house, and would thrive well in their sandy soils. Cabbages and cauliflowers should be planted out with the early rains, in ground previously well worked and fresh stable manure dug in. As a preventive of blight he recommended dipping the roots and stems in a strong solution made with quassia chips when transplanting. Land prepared as above would without further manuring grow most other vegetables the next year. Peas

and turnips could be more easily grown in the open field. The former he would sow through the grain distributor, setting the drill as for oats, and closing every alternate feeder. Turnip seed would be drilled in as shallow as possible, mixing a packet of seed with, say, 10lbs. of super.—[What is meant by a packet of seed—an ounce or a pound?—ED.]—and sowing at the rate of 140lbs. to the acre. He advised planting all vegetables in rows, so that the ground between could be hoed and kept free from weeds. Carrots and parsnips should be sown thickly, with a foot between the rows, and thinned out later on. Where water was available, tomatoes, melons, and squashes could especially be grown for summer use. The vegetable garden should be a valuable asset to the farm, especially on the smaller holdings.

WESTERN DISTRICT.

Cummins, July 3.

PRESENT.—Messrs. Cooper (chair), Hill, Hamilton, R. Sivour, J. and I. Durdin, Nosworthy, Potter, Farmilo, Brown, and W. Sivour (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that 12 meetings had been held, with an average attendance of 10. There had been an address, and 11 papers read and discussed. The subjects treated were as follows:—"Growing of Fruit Trees," "Poultry," "Pigs," "Cattle," "Protection of Horses' Shoulders and Feet," "Hay-making," "Stripper v. Harvester," "Cleaning Wheat for Market," "Conservation of Water," "Preparation of Land for Sowing," "Farm Implements," "Grading Seed Wheat," and "Co-operation."

FALLOWING.—Mr. I. Durdin read a paper on this subject to the following effect:—In this district fallowing should start as soon as possible after seeding is over, providing there is plenty of horse feed and the land is cleared. The end of June or the beginning of July is a very good time to start fallowing, as a great deal of the winter then lies before us, so that the ground will not get too hard to plough. Perhaps it is more likely to get rather too wet; but if the ground is cultivated while in a moist condition it probably will not set very firm. I prefer the tine cultivator for this work, because it stirs the land up and does not turn it over, thus leaving the sour soil exposed to the sun. There are several different classes of land in this district. The sandy ground might well be ploughed four or five inches deep; in fact, the deeper the better. This would root out a lot of the broom and other small bush. The heavier land should not be ploughed so deeply, three or four inches being quite enough. Going deeper than this is liable to plough up too much clay. Fallow on new land does not need a great deal of working, as it is comparatively free from weeds, and the more the sun can get at it the better. If cultivated in the spring, and again just before drilling in the seed, it would make a very good seedbed. Stubble or old land needs more cultivation, and should be worked according to the state it is in in regard to weeds. It would pay us to fallow well; but poor fallow is better than none at all. I am of opinion that it does not pay to fallow new land where the mallee was dense while we can grow 10bush. or 12bush. per acre without. If we fallow new mallee land we have a double lot of shoots to cut, and all the extra working and horse feed to consider for an extra 3bush. or 4bush. of wheat per acre. I should be glad to know the opinion of members on this last point. A good discussion followed. Mr. Potter had tried deep ploughing, and did not think it paid in the first year. It took a great deal of power to pull the plough a little deeper the second time. Members considered that where a thick mallee scrub could be rolled and a good burn obtained it would be better to put this under crop and fallow the stubble land, as when new land was fallowed the mallee shoots seemed to grow far more quickly in the first year than they did afterwards. Some members thought the ground did not need much working after it was ploughed, because there were no weeds or wild oats to be killed in this district. The Hon. Secretary thought it would be a good thing if the land was covered with wild oats, as it would make the farmers work the land more, in addition to supplying feed, which was at present a great difficulty.

Miltalie, July 3.

(Average annual rainfall, 14½ in.)

PRESENT—MESSRS. J. W. Atkinson (chair), G. W. and J. W. Story, Smith, Frost, Laffin, J. and B. Jacobs, L. J. and W. H. Atkinson, Howell, Tapley, Wright, Hier (Hon. Sec.), and five visitors.

FIELD TRIAL.—This Branch has decided to join with the Utera Plains Branch to hold a field trial of cultivating implements on Mr. W. Jacob's farm on August 25th.

RAINFALL.—The Hon. Secretary reported that 3·33 in. had fallen during June.

"JOURNAL" CRITICISM.—Mr. G. W. Story read a paper on this subject to the following effect:—"It was the duty of the Bureau Branches to discuss papers that were read at other branches. He would, therefore, speak of various subjects arising out of the September, March, and April *Journals*. 'Agricultural Bureau Work,' September issue, page 170.—He commended Mr. Palmer, of the Koolunga Branch, for his paper on that subject, and hoped every member would take that advice to heart. They wanted their meetings to be interesting and instructive, and to see every member doing his best to maintain the interest of all branches. To make the meetings a success, and to maintain interest, united as well as individual effort was necessary. There was nothing more discouraging to Bureau effectiveness than the irregular, unpunctual, silent, and don't-care sort of member. 'Harvester v. Stripper,' April issue, page 809.—This subject was discussed by the Chairman of the Utera Plains Branch, who was esteemed as a practical farmer. He agreed with him that it would cost 6d. per acre more to strip with the harvester than with the stripper. He could not, however, see how he could work out the cleaning of wheat reaped off 500 acres with the motor-power winnower at £7 15s., including five men's wages and petrol for engine, unless it was a very poor crop. It was not stated what the yield was. Supposing the crop yielded 12 bush., or four small bags per acre, that would be 2,000 bags. To have that cleaned by contract would cost not less than 2d. per bag, or £25 for the 2,000 bags. To reap 500 acres with the stripper at 3s. per acre=£75, making a total of £100. To strip, clean, and bag 500 acres with harvester at 3s. 6d. per acre totals £87 10s., leaving a balance in favor of the harvester of £12 10s. The motor-winnower was a wonderful machine, and would clean wheat at a cheap rate, but it required five or six men to work it properly. Men were scarce, and would not come for a short job like that when they could get a constant job almost anywhere. To get the harvest operations over as cheaply and quickly as possible was the main aim of all farmers, and the harvester was far before the stripper and winnower in that respect. The harvester was quicker and cheaper, because with one operation wheat was reaped and cleaned ready for market. On an average they could take off more wheat in a day with the harvester than with the stripper. It only took about half the time to empty the harvester box that was required to empty the stripper, and they had not to exert themselves in the same way. The harvester was a very popular machine, and to-day probably as many were being used as strippers. They were recommended by nearly everyone that used them. He knew of one or two who had the motor-winnower to clean their wheat last season, and who had now ordered harvesters for the coming season. 'Destruction of Rabbits,' April issue, page 795.—Mr. Cook (Quorn Branch), in his paper contended that the best way to deal with rabbits was to erect netting yards around watering places during summer months, and make rabbits pay for their own destruction by the revenue from the skins. No doubt in that part of the State, where water was chiefly in dams, this could be carried out with satisfactory results, but would it be so successful here if they were to do the same? His opinion was that it would not, especially in the hills, where there were so many watering places. Undoubtedly they would be able to catch a lot in this way and make a good deal out of their skins, but the system would not pay expenses and loss of time. Skins or no skins, the quickest way of destroying the rabbits was the only one to consider. He maintained that the poison cart, fumigator, or straw and tar were the quickest and cheapest ways in the long run. He favored the last-named. Everybody in the district should be made to take united action in destroying the rabbits. In January, February, and March he would advocate poisoning with phosphorised pollard, going into every nook and corner wherever possible. If the rabbits took it well the first night they should go round again the next day and give them some more. After a day or two there would scarcely be a rabbit left. Then, if everyone went round with a shovel and filled in every warren with loose earth, first stuffing in a small sheaf of tarred straw, there would scarcely be a rabbit on the farm. What stragglers were left the dogs would be able to catch. Something in this way would have to be done if they were to keep the rabbits down, and they would have to work together. It was very annoying that since a rabbit inspector had been appointed for that district nothing had been done to compel landowners to kill the rabbits on their land, and they were very numerous as the result.

'Wheat Cleaning,' March issue, page 729.—He commended Mr. Wilson, of the Tatiara Branch, for his paper on this subject, and called special attention to it. He thought if every farmer were to clean his wheat to as high a standard as possible, there would soon be a bigger demand for South Australian wheat in the foreign markets."

Penong, July 3.

(Average annual rainfall, 12½ in.)

PRESENT—Messrs. Bennier (chair), Brook, Farrelly, Kreig, Edwards, J. B. and J. Oats (Hon. Sec.)

FARM MANAGEMENT.—Mr. Brook read a paper on this subject. He advocated having as much fallow as possible every year, and would start fallowing as soon as seeding was finished. He preferred early fallow, as it contained more moisture than the later fallow. He would keep a few sheep and turn them on to the land before fallowing to clear the land, and after ploughing would turn them in again as soon as any weeds were showing. Sheep would pay if not overstocked. The best time to start seeding in that district was the end of March, and it should be finished by the end of May. Wet days should be employed in overhauling implements and machinery, treating harness with neat's foot oil, and preparing in every way for harvest-time. Every farmer should have a blacksmith's shop and do as much of his own work as possible. Tools should all be kept in their proper places, watercourses kept clean, and wire netting in repair. Messrs. Farrelly and Edwards indorsed the statements made in the paper.

Shannon, July 3.

PRESENT—Messrs. Neate (chair), J. and S. Carey, W. and H. Glover, J. and M. Cronin, W. M. Smith, sen. and jun., L. B. and E. B. Smith, H. and A. Habner, Proctor, Kain, Havelberg, Williams, and J. J. Cronin (Hon. Sec.).

SAND IN HORSES.—Mr. Proctor wished to know a remedy for sand in horses. [The answer to this question has been published in the *Journal* several times. Members should keep their *Journals* and the index which is issued each year. The treatment for sand in horses is:—"Give thick pollard gruel, well boiled; boiled barley and wheat, separately. Horses affected with sand should not be worked, as work displaces the sand too quickly and produces colic. If it is necessary to relieve colic pains, give a bottle of chlorodyne and a tablespoonful of finely-powdered carbonate of ammonia in a pint of cold water every four or six hours until the pain is relieved. The sand must not be forcibly removed from the animals by giving purgatives, as such treatment usually ends in death. To prevent the accumulation of sand give a cold bran mash each week-end. Salt should also be provided for the horses."—ED.]

BREEDING AND CARE OF HORSES.—The Chairman read a paper on farm horses. In districts where the land was heavy to work, and feed was plentiful, he favored the Clydesdale; but, in this district, where the work was not so heavy, and food somewhat scarce, he preferred a clean-limbed animal, such as a cross between a Clydesdale mare and a Suffolk Punch stallion. This stamp had plenty of weight and a nice easy action. Only the best animals should be bred from, as it costs no more to rear a good horse than an inferior one. Regular feeding was essential. He recommended 25lbs. to 30lbs. hay chaff, and 8lbs. to 10lbs. crushed oats per day, given in three feeds, with some long hay at night. A supply of pure water, some rock salt, and good warm stables all played their part in keeping the animals in a fit condition for the hard work of the farm. Bluestone, in very small quantities, was recommended to purify the water in dams and tanks, and the importance of keeping up the condition of young stock right from the start was emphasized. Colts kept in good condition could be broken at 2½ years old, but should be given light work for half a day at a time for the first few months. The shoulders should be bathed with cold water and a little salt, and a well-fitting collar used which had been rubbed over with blacklead. A little care would keep the shoulders sound, and after a couple of years there would be little chance of trouble in that direction. Members were divided in opinion as to best breeds of horses for the farm work of the district, but most were in favor of the Clydesdale. Mr. Havelberg had fed horses on peas with excellent results. He had reaped 25 bags [? bushels—ED.] of peas from 1 bush. drilled into one acre. They should be drilled in May.

CABBAGE-GROWING.—Mr. Glover tabled a fine cabbage grown on his property.

ANNUAL REPORT.—The Hon. Secretary in his report said that the average attendance had been 12 members, and that 11 papers had been read and discussed.

Utera Plains, June 26.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Venning (chair), R., T., and H. Hornhardt, Gale, Holens, Deer, Lee, Garber, Guider, Parker, Beatty, Hill, Stephens, Pulford, Ramsey (Hon. Sec.), and four visitors.

ANNUAL REPORT.—The Hon. Secretary reported that eight meetings had been held in the year, with an average attendance of 11. Papers had been read on “Harvester v. Stripper,” “Grading Wheat,” “Care, &c., of Horses,” and “Rabbit Destruction.”

RABBIT DESTRUCTION.—Mr. Pulford read a paper on the extermination of this pest, as follows:—“In that district where the rabbit was a pest they had to find some means to keep it down. In January, when the green feed was gone, many thousands of rabbits were killed with various kinds of poison. Of phosphorised poisons he had had the best results with ‘Slayo,’ and had also used strychnine mixed with a paste of flour, sugar, and a little wheat spread on sandalwood limbs, with fair results. When the feed became green they had to find some other means than poison, as the rabbits would not take the baits. There was the fumigator and bisulphide of carbon with which a man could kill a good many rabbits in their burrows. He believed in setting the gas alight, as the smoke and fire did as much damage to the rabbits as the fumes, but in large paddocks, where the burrows were very close together, that method would be an expensive one, as very often the next morning the holes were open again. This necessitated going over the same ground again, entailing more expense for wages, carbon, &c. He had put paper over the mouth of the burrows and covered it with earth, and this was the best method he had tried, being cheap and very quickly done. He had covered over a hundred burrows in this manner, of which only one hole had been opened, and that was from the outside. Brown paper stood the weight of the earth better than newspaper, but he had used two or three thicknesses of the latter with success. Three or four dogs would pay for their registration many times over with the number of rabbits they killed in a year. He had one slut which dug out 74 rabbits in about three hours. She dug while the men blocked the other holes, and then as she brought out the rabbits they killed them. Coal tar and straw had been recommended for putting in the holes, but he had not yet tried this method. Blocking holes under wire-netting with paper had been successful, as the rabbits scratched till they came to the paper and then gave it up. He had purchased ferrets at £2 a pair, and while they lived they caught a few rabbits, but in the hot weather they died from dry rot.” A long discussion followed, some members favoring fumigating, others the use of paper for blocking the burrows, while others again pinned their faith to the ferrets.

Yallunda, July 3.

PRESENT.—Messrs. Provis (chair), Allen, Olston, Farnham, Wood, Elliott, and Wilson (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that six meetings had been held, with an average attendance of eight members. Ten visitors had attended. Papers had been discussed, the following being the subjects:—“Value of Experimental Plots,” “Treatment of Foals and Profitable Farming.”

CONFERENCE OF BRANCHES.—It was resolved to write the various Branches on Eyre’s Peninsula, with a view to arranging a conference in some central place.

SHEEP ON THE FARM.—The Chairman read a paper on this subject, as follows:—“It was most important that every farmer should keep some sheep, even if only a few. In the first place they were useful to clean fallow land when the farmer was too busy with other work to use the cultivator, especially at harvest time. In addition to this it was a great saving to have sheep to kill for use on the farm, especially at the present high price of meat. The skins and wool brought a substantial income to the farmer. For this district he would recommend the pure Merino as the most suitable type. They were easy to keep and more contented than other breeds. In that locality wool must be the first consideration, as they could not depend on being able to rear lambs fit for export, and the distance from the freezing depot was too great. Every farmer who could keep from 200 to 300 sheep or more should have a small shed, with clean floor cards, to shear on, if possible, and be very careful to keep the wool clean; as if not kept clean the buyers would jump at the chance of giving a lower price for it. Care should also be taken to select good rams—one ram to every 70 or 80 ewes. It was not advisable to breed from two-tooth ewes, as young ewes not only gave a lower percentage of lambs but they did not make good mothers. Every farmer should be careful to cull his flock at shearing-time, as it did not pay to keep old broken-mouthed sheep. These would pay better to

fatten and kill or sell to the butcher. Care should be taken not to overstock; but sheep would thrive in paddocks that had been grazed with cattle or horses, as they would eat many weeds that other stock would not touch, and also would bite much closer to the ground."

EASTERN DISTRICT. (EAST OF MOUNT LOFTY RANGES.)

Lameroo, July 3.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Eime (chair), White, Skinner, Jeffrey, Needs, Leckie, Shannon, Dodds, Walsh, Wray, Ross, Dunstone, S. G. and W. J. Trowbridge, Kentish, Thyer, Tyler, R. and A. J. A. Koch (Hon. Sec.), and five visitors.

CARE OF HORSES' SHOULDERS.—Mr. Shannon read a paper on this subject, which he considered to be a very important one. The principal causes of sore shoulders were over-work, over-feeding, and ill-fitting collars. If over-worked a horse became very heated, and on removal of the collar the sudden change of temperature caused the shoulder to scald. An effective remedy was to bathe the shoulder with warm water immediately the collar was removed. Over-feeding with corn made the blood too hot, and as a consequence boils formed on the shoulders, which eventually broke, leaving nasty sores. A collar should fit closely into the horse's neck. It should neither be too long nor too narrow on top. A collar that was too large would rock about and be sure to chafe. The harder a collar was stuffed the better, provided the pressure on the shoulder was even. A loose collar soon got out of shape. To prevent chafing he recommended either a leather false collar or a bran bag. The bag answered very well and absorbed the sweat, keeping the shoulder thoroughly clean. If farmers procured suitable collars, used false collars, and bathed shoulders with warm water as indicated, there would be little fear of their horses having sore shoulders. In the discussion which followed the use of traction springs on each chain was recommended, and the following remedies were stated to be of value, viz., shifting the draught on the hames from time to time, soaking collars if a little too large, sulphur in the food, and an ointment made of lard, with sulphur, kerosine, and a little pure carbolic.

SUPERPHOSPHATES.—Mr. Trowbridge, in answer to a question, did not think South Australian super. yielded so well as Mount Lyell. Mr. White reported that in experiments made by himself last year with South Australian super, mineral, Mount Lyell super., and Barossa phosphate, he had reaped the heaviest yield of all (18bush. per acre) from the plot manured with South Australian super. Two hundredweights of ground phosphate (Barossa) rock gave much less return than 70lbs. of South Australian super.

Mannum, June 26.

(Average annual rainfall, 11½in.)

PRESENT—Messrs. Walker (chair), Scott, Faehrmann, Wilhelm, Schulze, Lenger, and Scheutze (Hon. Sec.).

STARLING PEST.—Mr. Faehrmann reported that starlings were rooting about amongst the young wheat plants and were pulling a lot up to get the seed.

CONCRETE FENCE POSTS.—This subject, which is dealt with in the June issue of the *Journal*, was discussed. All agreed that the matter was a very important one, especially in sparsely-timbered localities, and was worthy of discussion at the Annual Congress.

Morgan, June 26.

(Average annual rainfall, 9in.)

PRESENT—Messrs. R. Wohling (chair), Moll, Keough, Hausler, R. Wohling, jun., Pope, Hoepner, Hewitt, H. Wohling (Hon. Sec.), and one visitor.

WATER CONSERVATION.—Mr. R. Wohling, jun., read a paper on the conservation of water to the following effect:—For a long time farmers in this district had allowed a great deal of rainwater to run to waste in the winter. Many were now turning their attention to the construction of dams and tanks, and this policy should be vigorously pursued.

By expending a little time and money in this way a year's supply, or more, of water could be stored. Drains leading into dams should be kept clear of sand and bushes, so that even a light shower would put in a fresh supply of water. Dams should be well fenced, and the water for stock pumped out as required. Members generally agreed with the views expressed in the paper, and recommended that drains should be about 2ft. wide and not deeper than 3in. or 4in.

Renmark, June 30.

(Average annual rainfall, 11in.)

PRESENT.—Messrs. Basey (chair), Waters, Muspratt, Wilkinson, Howie, Geniste, Nuthall, and Cole (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that the average attendance had been six members. He also reported on the year's work.

CONCRETE POSTS.—Mr. Rogers read an article from the June *Journal* on this subject. Members thought they would prove too costly for trellis purposes at present.

SMUDGE FIRES.—Discussion on this subject took place. Members were of opinion that small heaps of stable manure, placed around an orchard every chain and then fired, was a very effective plan for protecting them from frosts.

Rhine Villa, July 2.

(Average annual rainfall, 10½in.)

PRESENT.—Messrs. G. Payne (chair), F. Payne, Deane, Mickam, Hecker, and Vigar (Hon. Sec.).

LAND VALUE AND PRODUCING CAPACITY.—Mr. Vigar read a paper on the question as to whether the prices asked for land in this district were beyond the producing capacity of that land. During the last eight or nine years land values in this State had risen by 60 per cent. to 100 per cent. In spite of this he was of opinion that farms were yielding better profits to the owners now than ever before. In earlier years 8bush. had been considered a good return, and 4bush. or 6bush. was not an uncommon yield. To-day, with machinery, more thorough cultivation, and the use of fertilisers, in many instances the yield had been doubled. Figures were given to show that in spite of increased rental and cost of production owing to the additional yield now obtained (calculating at 3s. 6d., the price per bushel that ruled 10 years ago), the return to the farmer was about 9s. 6d. per acre above the amount realised at that earlier period. The advent of superphosphates had made it possible to keep much more live stock and to go in for dairying, &c. Probably there was now 50 per cent. more stock in the district than a few years ago, and while the dairying might not add very much to the bank account in cash, it was surprising what a difference there was in the store bills where mixed farming was carried on. If further proof were needed, they had only to look at the substantial improvements that were being made to farms in the way of buildings, &c. Mr. F. F. Payne contended that the price of land had risen beyond its true value, but the other members agreed with the writer of the paper.

Sherlock, June 26.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Wood (chair), Goldsworthy, C. J. and A. Osborn, Whyatt, Illman, Hensel, Nock, Stringer, Coombe (Hon. Sec.), and nine visitors.

ANNUAL REPORT.—The Hon. Secretary reported that since the inception of the Bureau in August last 10 meetings had been held, with an average attendance of about eight members and four visitors. The meetings had been interesting, but a number of members had been very lax in their attendance. Five papers had been read and discussed. He suggested the appointment of a committee to arrange programme of discussion, the subject for discussion to be advised at least one month ahead, so that members may know beforehand what matters would be dealt with. He thought it was within the power of members—especially in a new district like this—to greatly help each other by bringing forward at Bureau meetings any matters of practical interest, successes achieved, difficulties encountered in their work, &c. Some discussion followed, and a programme committee was appointed as suggested.

MANURE EXPERIMENTS.—The Hon. Secretary stated, in reply to inquiry by the Editor in June issue of *Journal*, that he did not reap separately the plots manured with different quantities of fertiliser, but judged the results from the work of the reaper. He certainly could not see any difference in the crops.

SOUTH AND HILLS DISTRICT.

Clarendon, June 28.

(Average annual rainfall, 33 $\frac{1}{2}$ in.)

PRESENT—Messrs. H. C. Harper (chair), A. A. T., and E. Harper, J. and L. Spencer, Richards, Sheidow, White, Phelps (Hon. Sec.), and one visitor.

ANNUAL REPORT.—The Hon. Secretary reported that 13 meetings had been held, with an average attendance of 14 members. Eight papers had been read and various subjects discussed. Interest had been maintained throughout the year.

OIL ENGINES.—Mr. White read a paper on the use of oil engines on farms, as follows:—“For a long time gardeners and farmers were apparently satisfied to use horseworks for pumping water, cutting firewood and chaff, but with the gradual advance of the times, to save labor and expense they were nearly all studying the greatest amount of work that could be done at the least cost. Having now had practical experience with an oil engine, he would be loth indeed to have to revert to the old method of cutting firewood, &c., by horsepower. In his opinion there was no work that appeared so distressing, and at the same time made horses so slow, as working either a circular saw or chaffcutter; and very often the animals could be used on the farm or on the roads to much more profit. With horsepower it took two or three men, with an oil engine the same amount of work, or more, could be done with one man less. With his 8 B.H.P. Blackstone oil engine he had cut on more than one occasion, with the assistance of one man, 5 tons of wood in 9in. lengths in two hours, at a cost of not more than 2d. a ton for kerosine, and with a No. 4 Bagshaw cutter a man could cut 2 tons of hay per hour at a cost of under 3d. per ton. A practical man informed him that for a buyer who was thinking of going into the business, a very fair and reliable calculation as to power needed was as follows, viz., a 5 B.H.P. oil engine to drive a No. 3 cutter with elevator; 6 $\frac{1}{2}$ B.H.P. engine to drive a No. 4 cutter with elevator and 30in. circular saw; 8 B.H.P. engine to drive a No. 5 cutter with elevator and 40in. saw; this allowed for necessary power with the engines quoted to work well under the load. In conjunction with chaffcutting and sawing, many occupiers of farms and gardens were now turning their attention to irrigation, and with a sufficient supply of water properly utilised, very heavy crops of maize, sorghum, lucerne, barley, &c., could be grown in the summer. To those who kept milking cows this was invaluable, and produced an abundant supply of milk at a time of year when butter was selling at highest prices. There was not the slightest doubt that some of the finest land in the State for the above purposes was situated in and around that district, and this also applied to fruit and vegetable growing. With irrigation potatoes could be grown at the time of year when almost free from risk of having them cut or destroyed by frosts; but not only this, summer crops of potatoes were usually much more prolific, and in many cases quite 100 per cent. heavier, than the winter crop. In the hilly districts using sprinklers instead of running the water in channels was much more effectual. This method used less than half the quantity of water, and did more good, without the danger of washing the land into holes. There was little or no gain in having a large reserve tank placed at a high elevation, pumping the water into it first, and then working the sprinklers from it, as this necessitated two lines of piping, which added much to the cost. With an up-to-date double-action pump, sprinklers could be worked more effectually direct from the pump while the engine was running, and this gave a splendid pressure. Sprinklers that were mostly used took about 300galls. of water per hour. Some reliable calculations for pumping plants were as follows, viz., a 4 H.P. engine would work a 3in. double-action pump, delivering about 2,500galls. per hour through a 1 $\frac{1}{2}$ in. main, lifting the water 200ft. if required. A 6 $\frac{1}{2}$ H.P. engine and a 4in. double-action pump would give about 3,500galls. per hour through a 2in. main, lifting it 200ft. high. An 8 H.P. and 6in. double-action pump would give about 5,000galls. per hour through a 3in. main, delivering about 20ft. high. If it was necessary to deliver the water higher than mentioned, increasing size of engine was all that was required. When larger quantities of water were required, and the elevation from the level of pump was not more than 45ft., the following plants gave good results, viz., 5 H.P. engine and 1 $\frac{1}{2}$ in. centrifugal pump through a 2in. delivery pipe would give about 4,000galls. per hour; 6 $\frac{1}{2}$ H.P. engine and 2in. centrifugal pump through 3in. delivery pipes would give about 7,000galls. per hour, and an 8 H.P. engine and 3in. centrifugal pump, 4in. delivery pipe, would give about 15,000galls. per hour. In nearly all districts now, owners found by irrigating fruit trees as well as vines at the proper time, the yield was considerably increased and the quality of the fruit improved. One important point which must not be forgotten was that the more they irrigated the more fertilisers must they use.” Members were agreed that it was wise to procure the most up-to-date machinery possible. Mr. A. A. Harper wished to know whether an oil engine or a gasoline engine would be more economical for pumping.

Cherry Gardens, June 29.

(Average annual rainfall, 33in.)

PRESENT—Messrs. Stone (chair), Jacobs, C. and J. Lewis, Brumby, Broadbent, Chapman, Kayser, Curnow (Hon. Sec.), and one visitor.

STRUTTING STRAINER POST.—Mr. Kayser wished to know the best position in which to fix a strut to a strainer fence-post. Members thought the best way was to place the strut at about the middle of the post. If placed near the top it would tend to lift the post from the ground when the wires were tightly strained.

USEFUL INDIGENOUS BIRDS.—Mr. S. H. Curnow read a paper on this subject. [The paper is printed in another part of this issue.—ED.] A short discussion followed, in which the value of certain birds in farms and gardens was admitted. Mr. Jacobs disagreed with the statement in regard to the vocal powers of the thrush, and claimed that the local thrushes were very sweet songsters.

Dingabledinga, July 20.

(Average annual rainfall, 30in.)

PRESENT—Messrs. Trumper (chair), Allen, Felix, A. P. and F. DeCaux, and Chenoweth (Hon. Sec.).

GRASSES AND FODDER PLANTS.—Mr. H. Allen read a paper dealing with the most suitable grasses and fodder plants for the moist land of the district. He recommended planting turnips and Swedes in February. Turnips could be grown so as to be ready for the stock early in April. He would plant about $\frac{1}{2}$ lb. of seed to the acre, broadcast, mixed with fine bonedust. Liberal manuring was necessary. The earliest cereal for greenfeed was Cape barley, and although the stock could very seldom be turned on it in these wet lands, it was ready for cutting very early. Oats were also good for greenfeed, but not so early as barley. Some such clovers as *Lotus major* should be grown, and this would not be harmed to any extent by surface water, while it would provide a heavy growth of feed. *Trifolium subterraneum* was a clover which would grow on rather poor, wet land better than almost any other fodder. If planted in autumn this subterraneum clover would soon produce a thick growth, notwithstanding all wet, frosts, etc., and by November should be at least 12in. high. Once sown, it would reproduce a good crop from its buried seedpods for many years. He also recommended kangaroo rape, which had been grown to a height of 11ft. in fairly good ground. The outstanding characteristic of this variety of rape was the brittleness and succulence of the stalks. It grew so well that some farmers declared that it was a new giant thousand-headed kale. For summer fodder lucerne was in the leading position, and although in some districts it required irrigation, he believed that in that cool district it could be grown successfully without irrigation. Maize was a great fodder for cows and other stock during the summer, and with sorghum should grow well in their cool climate. He would drill such fodders as these, and also millet and amber cane, in rows, leaving room to use the cultivator between the rows to conserve the moisture. Every farmer should experiment and find out what fodder was best suited to his soil and stock requirements, and the question of conservation of water for irrigation should receive the attention of them all. In the discussion which followed members thought Swedes preferable to turnips. Maize was considered to be a profitable crop to grow, either as fodder or to harvest the grain for market. The Hon. Secretary wished to know if it would be possible to gather maize in time to save the stem to chaff for cattle, using the grain for poultry and pigs. [If the maize were left long enough for the corn to ripen it is very doubtful whether stock would eat the stalk, and even if they did it would contain but little nourishment. The crop for green feed should be cut when the corn is in the milk stage.—ED.]

Forest Range, July 1.

(Average annual rainfall, 36in.)

PRESENT—Messrs. F. Green (chair), A. H. and R. Green, McLaren, Vickers, Allen, Pollard, and Monks (Hon. Sec.).

SURPLUS FRUIT.—Mr. McLaren read a paper on "How to deal with waste fruit, codlin apples, &c.," to the following effect:—"There had been a good deal of controversy in regard to putting on the market codlin moth infested and inferior apples—a practice which was detrimental to the price obtained for good fruit. He had heard it suggested that it would be better to make manure of such fruit by burying it rather than glut the market, but though he considered it would be better not to put such produce on the market, better use could be made of it than using it as a fertiliser. Seeing that there was an ever-increasing demand for dried fruits at a fair price, it would pay growers to dry a great deal

which now brings little or no return. In the Angaston district almost every orchardist had his peeling and slicing machines to deal with all rejects and windfalls. This fruit was dried in the sun, and with these two simple machines one man and a boy could peel, slice, dip, and put on trays 25 cases of apples per day. He was satisfied that it would pay the growers in this district to adopt a system of drying. They knew that it could not be done here by sun drying as at Angaston, as not only were the atmospheric conditions against it, but in the apple season most of the growers were going regularly to market and could not be bothered with drying operations. He thought the difficulty could be got over by co-operation in the establishment of a drying plant, on a small scale to start with. It would not cost much to erect an evaporator in some central position, and being a well-timbered district the cost of fuel would be light. There were some growers whose time was not fully taken up with their own fruit at that time of the year, and they would, no doubt, be willing to undertake the management. It was a much easier matter to deal with a shipping firm when a large quantity of uniform grade, good colored, dried fruits had to be sent away than it was to deal with an agent for small lots of mixed qualities. When once a plant was established, if there were a glut in the market a larger quantity of fruit could be dried than was usual without any difficulty; and this could be applied to plums in a glut year, when the jam factories as well as the market were glutted. He believed that it would pay the growers to co-operate and establish a drying plant. Under ordinary conditions it would keep a lot of inferior fruit off the market, and the grower would get a better price. In drying apples, about 6lbs. of the fruit ready for market would be produced from a case of fresh fruit, while plums would yield from 15lbs. to 20lbs. from a case." Mr. F. Green said the matter should have been settled years ago on the co-operative principle. He knew a man who had started a drying plant on a small scale to treat rejected and waste apples. Although a novice, he had cleared £50. Growers were losing heavily by putting waste and windfall stuff on the market. A drying plant should be established, and the management be arranged among those interested in it. He thought an outlay of £50 would be enough at the start. Most of those present spoke on the subject, and all agreed that something should be done on the lines indicated above, but the experience of several had been that so-called co-operative enterprises had been far from satisfactory. Replying to a question, Mr. McLaren said that nearly all the varieties of apples grown in that district were suitable for drying, provided they were fairly matured. He also quoted one grower at Angaston who had about 4,000 trays of dried fruit in a season, he having dried the whole crop. On the motion of Mr. H. Green a committee was appointed to formulate a scheme for a co-operative drying factory upon the lines advocated in the paper.

Hartley, July 3.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Wundersitz (chair), W. and C. Brook, Clark, Paech, Pratt, Stanton, Tydeman, Phillips, Hudd, Symonds, Birmingham (Hon. Sec.), and one visitor.

PLoughing.—The Chairman read a paper on the subject of ploughing, a matter which he considered did not receive the careful attention that it deserved. The use of multi-furrow ploughs made it more difficult to do the exact work that used to be accomplished with the two-furrow set plough. The farmer now rode on his plough, and went round and round the paddock. As a result of this the soil was continually being thrown towards the fences, frequently threatening to bury them altogether, while the middle of the paddock became more like a dam each year. In preference to this rough and ready method, which had as its only recommendation the comparative ease with which it was done, he liked to plough in lands two or three chains wide. Much better work could then be done, and the fences would not be buried. It was also more convenient to drill and harrow close after the plough. Members were very much in favor of ploughing in lands as described in the paper.

CRACKED GRAIN.—Members considered that the harder wheats were more liable to crack than others, but also thought weather conditions had a great deal to do with the trouble. They considered the beaters should be carefully set, so as to be just close enough.

Kingscote, July 5.

(Average annual rainfall, 18½in.)

PRESENT—Messrs. Turner (chair), Thorpe, Bell, Mitchell, Nash, Wallace, Wright, and Cook (Hon. Sec.).

CASTRATION OF COLTS.—A paper written by Mr. E. P. Yeatman on this subject was read by the Hon. Secretary. The writer advocated castrating when the colt was between

one and two years of age ; but animals required for heavy work should not be operated upon as early as those for lighter work. The horse should be in good health and condition, and be kept without food for five or six hours before the operation, so that he would not injure himself internally when struggling. Cold and damp weather should be avoided, and the operator's hands and instruments should be well disinfected with a solution of carbolic or washing soda. The method of throwing the colt by means of a rope was then described, and also the way to proceed with the operation. The horse should be kept on soft food for a week afterwards.

PHALARIS COMMUTATA.—Mr. Bell tabled a sample of this plant which was grown from one seed last year ; it was cut in April, and was now over 2ft. high. It stood very severe frost.

DISEASE OF ORANGE TREES.—Mr. J. Wright tabled a nice spray of oranges. The leaves, however, were partly covered with a black smut. The grower wished to know what to do for this trouble, as it was very prevalent at Cygnet River. [If the Hon. Secretary had forwarded some of the affected leaves it would probably have been possible to identify the trouble and recommend some treatment.—ED.]

Longwood, June 26.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. Oinn (chair), Nicholls, Roebuck, Glyde, Furniss, Pritchard, Vogel, Coles (Act. Sec.), and two visitors.

POTATO DISEASE.—Samples of diseased potatoes were tabled, the trouble being quite apparent from the outside of the tubers. On being cut they presented a peculiar soapy, rusty, and glassy appearance. They were very hard when raw, but harder still when boiled. The trouble appeared worst at the stalk end. The disease was met with in all soils, and had been found in new soil treated with stable manure. Members were still of opinion that the trouble was in the seed used.

CARE OF STOCK.—Members considered that stock in this district should be confined in a small space and hand-fed. Dung was a very important item and should not be wasted in the scrub.

EXPORT OF FRUIT.—Papers from Clare report of January 8th meeting and Angaston January 30th on this subject were read and considered by members to give a good view of both sides of the export trade. Mr. Furniss believed that last season pears would have arrived in excellent condition, and thought it a great pity that the experiment shipment was not sent in January. Members asked why other ports than London were not tried for a market for South Australian fruit, such as Hull, Manchester, &c. [This is a matter which is in the hands of the shippers. The Commercial Agent, Major Norton, is asking the same question.—ED.]

FRUIT-TREE SPRAYING.—This branch again passed a resolution that the various remedies on the market for insect pests and fungus diseases should be tested at the Mylor Typical Orchard and the results published in the *Journal*.

Mount Pleasant, July 9.

(Average annual rainfall, 27in.)

PRESENT.—Messrs. Giles (chair), C. and W. Royal, Lyddon, Miller, Tapscott, and Vigar (Hon. Sec.).

CO-OPERATIVE SHEARING.—Mr. Giles dealt with the advantages of co-operative shearing, and said that as most farmers used their sheds for other purposes than shearing a great deal of trouble would be saved if they had not to prepare them for shearing operations. He considered it would be a great advantage to farmers with small flocks to have the shearing done quickly and the clip prepared by an expert woollenser. Mr. C. Royal, while admitting there were many advantages in the co-operative system of shearing, thought that as operations were often hindered by wet weather owners would not know what to do with their sheep if such a contingency arose and they were several miles from home. Mr. Giles thought that difficulty could be overcome by only taking sufficient sheep for one day's shearing and taking back those which had been shorn on the previous day.

Port Elliot, July 17.

(Average annual rainfall, 20½ inches.)

PRESENT.—Messrs. H. B. Welch (chair), W. E. Hargreaves, Pannel, Brown, H. Welch, Green, Burton, Gurr, and W. W. Hargreaves (Hon. Sec.).

BETTER UTILISATION OF LAND.—The Chairman read a paper on this subject as follows:—“He would only deal with the immediate district, taking in Hindmarsh and Inman Valleys and a large area of scrub and hilly land. Many of the hillsides and gullies were ideal spots for orchards and vineyards; such as those flourishing near Port Elliot, and in Hindmarsh Valley there was plenty of land suitable for fruitgrowing. If wise choice of varieties were exercised the export demand could be relied upon at what appeared to be a fair price, and as the population increased many hundreds of people should make a good living by fruit cultivation. Like all other callings it required experienced people to succeed; though not many of the young men were looking to horticulture now, because agriculture was in such a prosperous condition and looked upon as the nearest road to fortune, putting all other pursuits in the shade. Many remembered when crops were poor and prices low, and it would be wise for enterprising young men to extend the orchards, principally for the export trade. Vegetable-growing could be combined, as there was a steady demand during the summer for fresh vegetables. Quantities of vegetables had to be brought here from the Adelaide market, a state of affairs which should not be while there was so much suitable land in the district lying almost idle. Two orange groves in Hindmarsh Valley, which he had seen lately, were object lessons in what could be done by irrigation. The trees were so heavily laden with fruit that the leaves could scarcely be seen. These were grown where the old settlers said “You cannot grow oranges here, the frost is too severe.” One grower in the Hindmarsh Valley got as much as £5 for oranges from one tree last season; he now had 800 trees planted. Of course situation as well as rich soil had to be taken into consideration to be successful, and careful cultivation carried out. Another source of profit last season was almond-growing. One gardener near Port Elliot sold £50 worth, and there was plenty of land well suited for almond-growing, although parrots had to be reckoned with, and where not much disturbed they got most of the crop. They had some land that had given good potato crops with the help of irrigation and manures. Some of the cleanest and best of potatoes came from Hindmarsh Valley, and there was plenty of scope for increased acreage, as only a very small portion of the suitable land was under that crop. Onion-growing was also receiving attention, and paying well on some of the local soil; but like other products, someone with experience was needed to grow them successfully. Peas, wheat, and oats—the latter mostly for hay—were being grown much more extensively this season, as it was found that cultivation with manures returned fair crops, and very much increased the fattening properties of grass and herbage. He wished to point out the wisdom of planting trees for timber in many parts of the district, especially where the fine gum trees had been taken for the sawmills. There were hundreds of acres that were suited for growing pines. Just out of Victor Harbor some splendid young trees were growing on light soil which was of little use for grazing or cultivation. Timber would soon become more scarce than ever throughout the world, therefore we should try to grow our own timber. Pines seemed to be very desirable for timber trees, and our climate and soil was suitable, even to the seacoast. No doubt it would be said that there was too long to wait for a return, but they could wisely put a few trees in each year, and the young people would reap the benefit. Not only would the timber be a valuable asset, but the comfort of shelter and shade for the farm stock had to be considered, and the healthy influence of timber generally. Much of the scrub land could be made of some value for timber and wattle plantations, and some enterprising people were spending time and money in growing good timber and wattle-bark where useless scrub was previously to be seen. It was necessary to fight the common enemy, the rabbit, and people were doing good work in that direction. Scrub fires also had to be reckoned with, and this was best done by clearing and ploughing strips, especially round plantations. He remembered wattle-bark being sold there at £2 per ton, and when it rose to £5 5s. they thought it a good price. The cost of stripping was nearly twice as much as in the early days, the wattles then being larger and more easily stripped. Some people suggested that the Government should be asked to plant timber in those parts. No doubt it would be a reproductive work and would give employment to some of the people. A larger portion of their land might be devoted to better grasses. He worked a small piece of land—about half an acre—which was of poor quality and covered with sorrel, and now had a heavy crop of oats on it and was cutting it for green-feed. He had put on about lewt. of bonedust, and was sure that in its natural state the half-acre would not have kept a goat for six months out of the 12. Peas for sheep or pig feed had been profitably grown in this district, and even lambs paid to fatten on a crop of peas. Probably pigs paid better, as they brought 6d. a pound, while lambs or mutton frequently brought less than 2d. per pound. Breeding good horses was profitable, and the draught stock was undoubtedly being improved, although there was room for increased numbers being reared in that district. One of his sons sold three young draughts a week previously for £100.” Members considered that onions needed manure when planting, but found

stable manure introduced too many weeds for onions. Ashes were recommended if sufficient were obtainable. It was considered that it paid well to grow peas for pigs.

BIRD PESTS.—Members complained that starlings and sparrows did a lot of damage in this district.

Strathalbyn, July 19.

(Average annual rainfall, 19½ in.)

PRESENT—Messrs. Fischer (chair), Rankine, Gardner, Collett, Nicholls, Heinjus, Watt, and J. R. Rankine (Hon. Sec.).

CO-OPERATIVE MACHINE SHEARING.—A letter from a certain firm of shearing contractors, offering to form a depot in the district if a guarantee would be given for a reasonable number of sheep, was received. A long discussion took place, the members agreeing that a depot in the district would be a great convenience, but it would be for the whole district to take the matter up when the time was opportune. It was thought that the time would come when the shearing would all be done by machinery, as few, if any, young shearers were learning to shear with the blade, as shearers prefer machine sheds, and it would not pay small sheepowners to erect machinery if a depot could be installed in the district.

Uraidla and Summertown, July 5.

(Average annual rainfall, 42½ in.)

PRESENT—Messrs. R. Cobblewick (chair), F. Cobblewick, Kessell, Gore, Dyer, Cutting, Rowe, P. and T. Day, Collins, Hawke, Johnson, Hoffman, and Snell (Hon. Sec.).

MANURE FOR PEAS.—Discussion took place as to best manure for garden peas in new ground. Blood manure from the Export Department and sulphate of ammonia was recommended to be applied when the plants were half grown. Light dressings of bone-dust, potash, and—for sandy land—superphosphate, with a little ammonia, were also recommended.

POTATO BROWN ROT.—The question arose as to whether the land from which diseased potatoes were taken should be left for two or three years. Some favored that procedure, while others attributed the disease to the wet season, and thought there was not much danger for succeeding crops. [This disease is caused by bacteria, and all authorities on the subject agree that the land itself becomes infected, and that some other crops should be grown for a time.—ED.]

SELLING VEGETABLES BY WEIGHT.—Members were divided in opinion as to whether this would be practicable, some favoring and some opposing the idea.

LUCERNE.—In reply to a question, members were of opinion that lucerne-growing would pay in this district, though they admitted that very few had attempted it.

OILSKINS AND TARPAULINS.—Members wish to know a good recipe for making waterproof tarpaulins, &c. One method recommended was 1 lb. lampblack to ½ gall. of raw oil. Two or three coats put on thinly. [A very good method is to make the tarpaulin, coat, or other garment of good unbleached calico. Hang it up, and apply with a varnish brush one dressing of raw linseed oil with the addition of one teaspoonful of terebin varnish to a pint of the oil.—ED.]

Willunga, June 5.

(Average annual rainfall, 25½ in.)

PRESENT—Messrs. Pengilly (chair), Binney, Blacker, Bigg, Richards, and Hughes (Hon. Sec.).

FRUIT TREES BARKED BY RABBITS.—Mr. Hughes asked how to treat trees damaged in this way. He had bandaged them and banked them up with earth. [The Horticultural Instructor replies as follows:—"Wounds made by the gnawing of animals should be smoothed with a sharp knife, and after being covered with a plaster made of clay have a bandage wrapped around the injured stem or limbs to shelter them from the drying influences of sun and wind. If the wounds are very large and much woody fibre exposed, paint such woody portions with lead paint or Stockholm tar before applying the bandage. The bandage should be maintained until the wounds are callused over."—ED.] The Chairman reported that the bark had been stripped off the young shoots of his fruit trees. He attributed the damage to some insect or grub. This was also referred to the Horticultural Instructor. [Mr. Quinn replies:—"Most likely a cutworm or the curculio beetle

is responsible for the injury done to the shoots. If they are quite ringbarked, cut them back over a bud or buds below the injured parts, from whence new shoots will usually arise to replace those removed."—*Ed.*].

FALLOWING.—This question was discussed, and members were agreed that for this district deep ploughing was best. After ploughing some favored leaving the land until just before seeding, when they would give it a shallow ploughing. Others worked the soil up thoroughly with the cultivator before seeding.

EARLY AND LATE WHEATS.—The question of when to sow early or late varieties was referred to the Editor of the *Journal*. [If the crop is to be left for grain, the wheats that mature quickest should be sown last. Usually an early-maturing wheat will go down badly if sown too early.—*Ed.*].

SOUTH-EAST DISTRICT.

Kybybolite, June 3.

(Average annual rainfall, 22in.)

PRESENT—Messrs. Bradley (chair), Bail, Hahn, Lacey, A. and O. S. Debney (Hon. Sec.), and two visitors.

PREPARATION OF LAND FOR SEEDING.—This topic was introduced by Mr. Lacey, who had found that in some seasons the crop did better if the soil was finely worked, while in other years if the soil were left in rather a rougher state the best results were achieved. Fallowing would be necessary there to kill the sorrel. Mr. Bail thought ploughing was the most important part of the work. If this was done carefully, and the soil properly turned, it would be much easier to get it in good condition for sowing. He would strongly advocate harrowing after drilling. The Chairman advocated harrowing before and after the drill. A great point was to work the land when in good condition and not when very wet.

Mount Gambier, July 10.

(Average annual rainfall, 31½in.)

PRESENT—Messrs. Sassanowsky (chair), Mitchell, Edwards, Holloway, Pick, Kilshy, Buck, Kennedy, Sutton, Major, Bodey, Niquet, Smith, Keegan, Ruwoldt, Engelbrecht, Clarke, G. and D. Collins (Hon. Sec.), and one visitor.

SEED POTATOES.—A request was received from a member of the Bureau in Port Lincoln district for seed potatoes, and members agreed to provide half a ton in exchange for a similar quantity from Port Lincoln. The Hon. Secretary said Professor Angus had promised to send on shortly a supply of potatoes from Victoria for experimental purposes.

VETERINARY SURGEON FOR SOUTH-EAST.—Correspondence from Penola Branch on this subject was received. The members thought that a veterinary stationed at Naracoorte or Penola would be of little use to Mount Gambier district, where there was enough work to keep a veterinary employed. Mr. Keegan thought the Government veterinaries should visit the district occasionally and give instructions to young farmers in the treatment of stock complaints. Mr. Edwards thought the local School of Mines would be glad to form a class if the veterinary came down. Members of the Council of the School of Mines agreed to support the proposal. It was resolved that the Department of Agriculture be asked to arrange for one of the veterinaries to visit Mount Gambier each month, or every other month, and in the event of this being acceded to a class will be formed in connection with the School of Mines.

CANADA.—Mr. W. J. T. Clarke gave an interesting address of a conversational character on his recent trip through Canada. Their steamer that season was the first to go up the St. Lawrence, a splendid river, and reached Quebec on the 7th of May. Quebec was a beautifully situated town, but absolutely French. It was the place for landing immigrants, and they were pouring into Canada at the rate of thousands a month, but a great number of them were not such as would be accepted in Australia. They seemed to be mainly of the inferior

races of Europe—Servians, Bulgarians, and Central Europeans—while the people that were wanted here were the Scandinavians, Germans, Scotch, or English. There was no bar, however, to these people coming in except the health standard. At Quebec there were three societies, those of St. George, St. Andrew, and St. Patrick, who looked after immigrants from England, Scotland, and Ireland on their arrival, and saw them sent safely on their way. Each grown-up immigrant received 160 acres of land free; for each son over the age of 18 years another 160 acres, and they had the right to purchase an additional 160 acres alongside. The trip up the St. Lawrence River was the most beautiful part of his voyage. The river was 900 miles long and from 30 miles to two miles wide. All along its banks were a succession of French villages, and what struck him was that each village had a church of exactly the same design. The French-Canadians had every advantage—their own laws, and all their rights, which were reserved to them when they were taken over from France, and were much better off than in France. In Montreal, a city of 400,000 people, three-quarters of the people were of French extraction and the rest British. Although the buildings were wonderfully fine, the streets were dreadful. The made ones were of boards nailed at the ends to sleepers. (Laughter.) They had a nice idea in the French towns; they did not fence their gardens, and as one walked through the residential part one looked right across gardens. It had a very nice effect in the streets. In the farms it was the same, there were no fences. The timber being very soft pine-wood there, it did not last long as fences. He stayed three days in Montreal seeing all the buildings, and then took the Canadian-Pacific Railway, the most wonderful human work in Canada, and perhaps in the world. It was a splendid example of private enterprise. It was built on the land-grant system, and ran from Montreal to Vancouver—a distance of nearly 4,000 miles. The Canadian-Pacific Railway run also a line of steamers across the Atlantic to England, and a line from Vancouver to Japan. One could travel for a week in these well-appointed trains without leaving the carriages. He took the train on the morning of Monday at Montreal, and did not leave it till Friday night. The country for most of the route was densely timbered. There were three or four kinds of pine trees, spreading poplars, and birch trees. Most of it was small; he thought that possibly the best of the trees might have been taken out. The demand for timber there was tremendous. Through this forest country one travelled hour after hour. The land was poor, and there were no farms. The only places at which one saw human beings was at the sidings on the line, and there were Italian workmen everywhere around them. It was a great country for rivers and lakes. The prairies, further on, were as flat as they could possibly be as far as the eye could reach in all directions. Here there was no timber; the land was magnificent, and the traveller saw a large number of farms on them. But the agriculturists did not seem as if they had come to stay. They made their cottages and other buildings of wood, and erected no fences. He saw nothing like a garden in the whole 3,000 miles. There were lots of cattle and horses, but sheep were not much in evidence. Everything looked as if the people intended to get what they could out of the land and then go away. Then the traveller reached Calgary, a great horse and cattle district; but sheep were of no importance. One saw a few deer and other native animals. The horses struck him as wonderfully good. The prices they got for their stock were high. Weaned calves averaged from £2 10s. at the nearest station, yearling steers £3 10s. to £4, and two-year-olds £4 to £5 per head; and they got droppings of 65 per cent. to 80 per cent. of calves. After leaving the prairies densely timbered country was again entered, and then the line entered the Rocky Mountains. After crossing the Rocky Mountains the country got better to the west. It became very rich, and only wanted clearing of timber to be used. The temperature was much warmer, and more farms were found. The deciduous trees in the east were without their leaves then, but here the trees were in full leaf, and the chestnuts were in flower. Vancouver was a wonderful place. It was the terminus of the Canadian-Pacific Railway. Ten years ago there were very few inhabitants there, now there were 70,000 people. The timber there was of enormous size. In Canada there were three great industries—wheat-growing, timber, and salmon-fishing. The salmon came up the Fraser River in such shoals as almost to force the outer ones from the water. For three years they had a moderate amount of fish, but every fourth year the fish came up in incredible quantities, and then the canners made their money. Wheat-growing was the great industry of Canada. They had reaped 78,500,000 bushels in one year off 4,250,000 acres, or an average of 25bush. per acre. Their average yield of oats was 40bush., of barley 34bush. Their seasons were short; they had only 13 weeks to put their crops in and take them off. Canada was frozen over for seven months of the year, but they never mentioned that to a traveller. Instead of that they asked whether we were not drought-stricken in Australia. They cut their wheat and left it in stooks, after which it was carted to the thresher, and they used the straw for fuel. The wheat was carted in specially-made carts, each holding 90bush., to elevators that

disfigured the towns, and the grain was tipped in. An inspector came with a long tube and ran it in the different cars and secured a lot of samples, which were graded—No. 1, hard; No. 2, northern; No. 3, northern farmers'. These grades declared, certificates were sent to the farmers. Corrugated iron seemed to be unknown there. The elevators were covered with flat square sheets of galvanized iron, and their holding capacity was up to 7,000,000 bush. The grain was run into sluices and was raised by electric scoops, and passed through a gale made of revolving fans. The dirt passed through one tube into the lake, and the chaff and broken grain along another and was used for cattle food. A belt of steel buckets carried the grain to the top of the elevator, where it fell on to a rubber platform, which took the wheat on to whatever bin was required to be filled. The bins were round. The cost of storage was half a cent per bushel for 15 days, and then half a cent per bushel for 30 days afterwards. There was a "hospital" elevator to treat wet or dirty grain through the crops having been beaten down. The wheat was dried with hot air at the rate of 50,000 bush. in 24 hours. The lumber trade was a great business in Vancouver, and, indeed, all over Canada. When it was coming to an end no one knew. The oldest and best timber was being removed, but thousands of young trees were coming on. He described the great lumber mills at Vancouver, and said the timber was floated down the streams in immense booms, and then towed to the mills. The process of sawing the logs into planks and beams was interestingly described. Chinese, Japanese, and Indian coolies were working in the lumber mills, with of course Europeans in all the responsible positions directing operations. From Vancouver he went across to Honolulu. A visitor could not help admiring the Canadians, they were so remarkably loyal to Canada, but he could assure them, after going through it, that it was not anything like half as good as Australia.

Tatiara, July 17.

(Average annual rainfall, 19½ in.)

PRESENT—Messrs. Saxon (chair), Guy, E. W. and H. Milne, Wilson, Reschke, Staude, Watson, Prescott, Ross, Bond, Fisher, Campbell, Duncan, and Truman (Hon. Sec.).

FRUIT-GROWING.—Mr. Quinn's advice in regard to white ants in fruit trees and the failure of cherry trees to bear fruit was as follows:—"To the first query, the best method of ridding the trees of the termites was stirring up the ground deeply and frequently, having first taken as many away as possible. This acted as a cure when the pest were at the roots, as they disliked being disturbed from their feeding grounds and would go in search of another camping spot. If the ants were attacking the wood, the method was to cut away the diseased part and paint the exposed portion with either coal tar or some liquid poison, such as arsenic dissolved by boiling in a solution of washing soda, the proportions being half an ounce of arsenic to one ounce of washing soda in half a gallon of water. As regards unfruitful cherry trees, this might have been caused by either the flowers being affected by frost or cold cutting winds, or perhaps the growing conditions were not suitable; and another reason might be that the stocks on which the cherries were grown were over vigorous. This last condition would certainly tend to operate in the direction indicated.

CO-OPERATIVE SHEARING.—Mr. Reschke thought a shearing machine would be a good thing for the district. Mr. Wilson was also in favor, but would like to have an expert explain the matter in full, so that a special meeting could be called to discuss the subject. Mr. Campbell did not favor contract shearing, because it brought strangers into a district to carry out the work and young local men were kept out of it. It was decided to adopt Mr. Wilson's suggestion and obtain more information.

CO-OPERATIVE MILL.—Members were divided in opinion as to the advisableness of establishing a mill on the co-operative principle, some being averse to it because co-operative concerns were usually troubled by having too many bosses, while others thought such a scheme could be made to work well and result in a good price being obtained for the wheat and a bonus for members at the end of the year. It was thought that if a mill were started here it would receive good support in the district.

COMPETITION WHEATS.—Mr. H. Milne said that the competition wheats which he had received from the Government were making good headway. The germination was good in every case, and after the ninth day of planting the seeds had shown signs above the ground. He would like the Branch to state a day on which they could visit them and form an idea of the probable yield.

THE JOURNAL

BRARY

OF THE

26 APR 1911

Department of Agriculture OF SOUTH AUSTRALIA.

No. 2.

SEPTEMBER, 1909.

VOL. XIII.

Published Monthly by the Department of Agriculture.

All communications to be addressed:

"The Editor, Journal of Agriculture, North Terrace, Adelaide."

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E. H. COOMBE,

Minister of Agriculture.

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POINTS FOR PRODUCERS.

Prospects of the Season.

The farmers of South Australia have seldom labored under more encouraging conditions than they have this year. Following a remarkable run of good seasons and good markets in practically all branches of the agricultural and pastoral industries, the present year promises to eclipse them all; and there is every likelihood—given good weather for the wheat crop—that South Australia will this year establish a record in production, both in quantity and, it is hoped, in value. The conditions at seeding time could scarcely have been better than they were, and the same good fortune, so far as the weather is concerned, has attended the farmers to the present time. There has, perhaps, been too much rain in some places—especially last month, which was one of the wettest Augusts in the history of the State. Some towns have already had more than their average annual rainfall in eight months, and of the 141 stations mentioned in the rainfall table list on page 139, there are only five with less than the average fall of rain to August 31st. Beyond causing temporary floods, the heavy rain has not done very much harm. In a good many districts ploughing has been impossible, and fallowing has been delayed. It is to be hoped that farmers will not restrict their fallowing in consequence, because it is better to fallow late than not at all. The crops in practically every part of the State are most promising. A splendid hay yield is almost certain, and with a good October a record wheat harvest should be assured. Graziers have been equally as fortunate as agriculturists, the lambing having been good and feed for stock abundant.

The Commercial Agent.

The Commercial Agent (Major A. E. M. Norton) since his arrival from London has been engaged in delivering a series of lectures on the marketing of produce in England and on the Continent. Up to date he has addressed 30 meetings in various parts of the State, and in every instance, excepting when weather conditions were such that it was difficult for farmers to get into the towns, the attendance was very satisfactory. At the close of each lecture questions were invited and replied to by the Commercial Agent. Advantage was taken of the occasion in many places to express to Major Norton the appreciation of the producers for the excellent work he had accomplished on their behalf. The Commercial Agent will give an address at the School of Mines on September 14th, at 7.30 p.m., and will continue his country lectures after that date.

Judging Export Lambs at the Adelaide Show.

The awards of prizes for the best pen of export lambs at the Adeiaide Spring Show have in the past not given satisfaction to those closely in touch with the practical side of the export industry, because the fattest pen, which averages from 46lbs. to 50lbs. dressed, has always been successful. London account sales and salesmen's advices point out distinctly that heavy weight classes are looked upon with suspicion, and are usually sold at "Teg" prices. The judging and awards for this class should be of an educational character, and prizes should be given to lambs averaging from 35lbs. to 40lbs. dressed. New Zealand has already adopted this method.

Fruit and Plant Pests in South Australia.

In the course of an interview on his return from the Conference of Ministers of Agriculture in Melbourne, the Minister of Agriculture (Hon. E. H. Coombe) made the following statement to the daily press :—"In discussing the prevalence of fruit and plant diseases in the Commonwealth I could not help feeling that South Australia enjoys an enviable position in its freedom from some of the worst pests. We have escaped such troubles as the fruit fly, phylloxera, pear and cherry slug, and San Jose scale. This speaks volumes for the carefulness of Mr. Quinn and his staff in examining consignments. It is some satisfaction to know, too, that our comparative'y dry climate is less likely to favor the retention of the Irish blight than that of the other States ; but we must keep in line with their restrictive policy, otherwise we are blocked in their markets. There was one fact I was not proud of, and that was that codlin moth is worse in South Australia than in the orchards of any of our neighbors, and that this is the only State in which moth-infested apples are allowed to be sold ! I cannot help thinking that a great mistake was made a few years ago when the restriction on the sale of moth-infested fruit was removed. This is a matter which the Fruitgrowers' Association should take up, and a request from them to revert to the former condition of things would receive warm sympathy from me."

Advances to Settlers.

The Advances to Settlers Board, which was created by the Act passed in 1908, has presented its first report to the Commissioner of Crown Lands, and the report has been printed as a Parliamentary Paper. It was not until April 1st that the Board actually began its work, and the first loan was approved on May 5th. The report states :—"Altogether 11 applications for advances have been approved, either wholly or partially, and a total of £1,775 granted. Twenty-one applications have been considered, but

either in consequence of there not being sufficient improvements or that applicants required their liabilities (not mortgages) to be paid off, or to purchase stock, or for other things to which the provisions of the Act did not apply, 10 had to be declined. The public are only recently being made acquainted with the terms on which advances can be granted, or no doubt a much larger number of applications would have been made. To the end of year only 34 formal applications were received, but a number of verbal inquiries were made. In a number of instances applications, both verbal and in writing, have been made to pay off mortgages of from £400 to £500, and the Board recommends that the Act be amended to allow of advances to at least £600. Several applications have been made from holders of Closer Settlement lands for advances. It is well known that many of the holders of these lands have had to borrow at high rates of interest, or dispose of their blocks for want of capital, when a small advance would probably have enabled them to successfully continue in occupation. As the Board cannot see any extra risk in such cases, it is suggested that in any amendment of the Act these lands be included." Since the end of June 33 additional applications have been received.

The Lamb Season.

The abnormally wet weather experienced during July and August has had the effect of keeping the lambs back, and in consequence delaying the operations of the lamb export buyers. The lateness of the season can be better gauged from the fact that it is the first season on record since the inception of the export lamb trade that no lambs have been received at the Government Produce Depot in the month of August. The low values ruling in the London market will have the effect of reducing prices considerably this season; a drop of 2s. 6d. per head must be expected, and on present London values growers cannot expect to obtain more than 5s. 6d. to 8s. per head for lambs averaging 28lbs. to 40lbs. respectively. Holders of forward lambs would be well advised to draft the tops of their flocks and put them on the Adelaide stock market, where good values are now obtainable owing to the temporary shortness of supply.

Land for Settlement.

The American River Estate, on Kangaroo Island, known as Hart's land, which was repurchased by the Government with the intention of founding a settlement of Scottish fishermen, has been gazetted as open for application, the scheme of establishing the Scottish settlement having fallen through. The land is situated in the hundreds of Haines and Dudley, and comprises 8,960 acres. It has been cut up into 59 blocks, 23 of which vary in area

from 22 acres to 1,123 acres. The other 36 blocks are intended for residential purposes, and they vary in area from a quarter of an acre to four acres. Applications will be received at any time up to Tuesday, October 5th.

Instructor in Wool-classing.

Mr. Spencer Williams has been appointed Instructor in Wool-classing at the School of Mines in succession to Mr. W. J. Mathews, who resigned to take a position in the Department of Agriculture of New South Wales. Mr. Williams is a son of Mr. T. H. Williams, Deputy Chief Inspector of Stock in South Australia. He received part of his early education at the High School, Mount Gambier, and on leaving began to learn his business at various South-Eastern stations. Afterwards he entered as a student at the School of Mines, and made marked progress under Mr. George Jeffrey, who was instructor at that time. Mr. Williams then held a position at the woollen mills, Lobethal, where he had experience in manufacturing. He left to take a further course at the School of Mines, and the Board of Examiners reported highly on his work. He was awarded the gold medal for the best student in charge of a clip. He obtained the final certificate of competency in wool-classing in 1906, and proceeded to Melbourne, where, under Messrs. Haughton and Co., he continued his training. During the last 18 months Mr. Williams has been employed by Messrs. Bagot, Shakes, & Lewis as assistant wool valuer.

Almond and Orange Trees.

A correspondent from Woodville writes :—" My almond trees and others in this district have been showing signs of decay for several years, and from present appearances it looks as if the yield of fruit would be very small. A good deal of wood is dying. Three years ago, as the trees were not looking well, I cut them down to 6ft., and since then they have grown well; but the gumming which had previously commenced steadily increased, till now there are large patches about 4in. or 5in. square of considerable thickness on many parts of the trees. There are yellow patches on the leaves, a large proportion of which have fallen, also the fruit, which did not set properly. I have also many trees five years old which have only been slightly pruned; these are gumming, and shedding both leaves and fruit. With reference to orange trees, do you recommend digging under these and disturbing the surface roots ? " Mr. G. Quinn, the Horticultural Instructor, forwards the following reply :—" The almond trees are most likely badly attacked by shothole fungus. I would advise cutting out the branches which are failing, and spraying the trees in autumn, as the leaves fall, with strong Bordeaux

mixture. The lumps of gum may be scraped off the stems, and the wounds coated with tar (Stockholm for preference). This will check, but not absolutely prevent, the exudation of gum. We do not recommend you to dig deeply immediately beneath the orange trees close to the stems, but increase the depth as the distance from the stems increases, until outside the spread of the foliage the full fork depth may be taken with safety."

Feeding Peas to Sheep.

Ever since the excellent results obtained in San Luis, Colorado, in feeding peas to sheep have become generally known, more attention has been given to the use of this crop in making mutton. Recently the value of pea silage has become apparent. The large increase in the business of canning peas makes available a constantly increasing quantity of pea silage and cannery waste. In large feeding experiments which have been carried on with this material it appears that at the present market prices it can be used not only economically, but to advantage from the standpoint of the quality of mutton thus produced. Some of the canneries, recognising the importance of this by-product, are putting up silos for the purpose of preserving cannery waste and selling silage to sheep-feeders at one dollar a ton, with the understanding that the manure is to be returned to them for use on their pea fields. A number of varieties of peas are grown for canning purposes, and so far as experiments have gone, they all seem to be about equally valuable in the production of pea silage, although doubtless the common Canada field pea would be best of all for silage purposes.—*The United States Correspondent of "The Pastoralists Review."*

Natural Enemies of the Codlin Moth.

In a bulletin dealing with investigations respecting the codlin moth published by the Bureau of Entomology of the United States Department of Agriculture, Mr. E. L. Jenne writes as follows respecting the natural enemies of the codlin moth:—"On May 6th, while bagging fruit and collecting codlin moth eggs, about a dozen specimens of a red mite (determined by Mr. N. Banks as *Trombicidium* sp.) were observed crawling about the twigs and leaves. By accident one of them got into the box of collected codlin moth eggs on leaves. On examining the eggs in the laboratory later, the mite was found in the act of eating one of them. The egg upon which it was operating was in the black spot stage. When the mite had finished, the egg had the appearance of having hatched, except that the black head and cervical shield of the embryo remained visible underneath the eggshell. The mite was

then allowed to attack a larva that was just issuing from the egg, having crawled nearly all the way out. When examined three hours later, nothing was left of the larva but the head and shrivelled skin. This mite was later found to be fairly common on other trees as well as apple. Two species of ants, *Solenopsis validiusculus* Emery and *Cremastogaster bicolor* Buckley as determined by Mr. Theo. Pergande, were frequently found attacking live larvæ under bands. An ichneumon, determined by Mr. J. C. Crawford as the commonly recorded parasite of the codlin moth, *Pimpla annulipes* Brulle, was frequently reared from band-collected material. From one lot of larvæ taken from the bands, Mr. S. W. Foster reared 11 specimens of an undetermined chalcidid, possibly a secondary parasite. Two specimens of a small tachina fly, *Tachinophyto* sp. ? (determined by Mr. C. H. T. Townsend), were reared in 1907. One individual issued from a larva which was brought into the laboratory while still in the apple, though nearly full grown."

Agricultural Development in the Argentine Republic.

Some interesting information respecting the remarkable development in agriculture in the Argentine Republic is contained in the official statistics for the year 1908. Thirteen years ago there were, roughly, 9,000,000 acres under wheat, linseed, and maize, whereas last year the area under these three crops was 26,000,000 acres. The area under each crop for the years stated was as follows :—

	1895.	1908.
	Acres.	Acres.
Wheat	5,062,700	14,975,900
Linseed	956,700	3,789,700
Maize	3,073,100	7,345,500

In 1907-8 the total production was estimated at 5,238,705 metric tons, of which 430,000 tons are assumed to be required for seed, and 900,000 tons for consumption, leaving 3,908,705 tons available for export. The average yield of wheat in recent years has been about 11½ bush. per acre, but this relatively low yield (says *The Journal of the Board of Agriculture*, England) is counterbalanced by the fact that the cheapness and fertility of the land and the favorable climate enable the soil to be cultivated with a small capital, little expenditure being incurred for buildings, and no manuring being done. On the other hand, machinery is largely employed, particularly reapers, while no fewer than 6,186 steam threshing machines are returned as working in 1907-8. The cultivation of lucerne, which, apart from natural grasses, is the principal fodder crop, is also reported to have extended rapidly. No annual returns are obtained, but it is estimated that more than 10,000,000 acres are under this crop, compared with about 1,760,000 acres in 1895.

DEPARTMENTAL NOTES.

By A. E. V. RICHARDSON, B.A., B.Sc.

EXPERIMENTAL FARM ON EYRE PENINSULA.

The Government have decided to establish an experimental farm on Eyre Peninsula, and for this purpose block 36, hundred of Shannon, has been chosen. This block is situated in the northern part of the hundred, and in many respects is eminently suitable for an experimental station, as it contains classes of soil typical of Shannon and the neighboring hundreds.

A railway journey from Port Lincoln to Yeelanna, the present terminus, forms a most instructive study for soil variations. The journey for the first 10 miles is mostly through inferior country, consisting chiefly of outcropping limestone. In the hundred of Wanilla, however, the soil changes to a light loam overlying ironstone rubble and clay, the ironstone varying considerably in thickness, but averaging 3in. to 4in., and coming within a few inches of the surface. This ironstone land has the reputation of producing good crops in moist seasons; but whenever the spring is dry the yield is much lower than might be expected from the amount of vegetative growth. This, in all probability, is due to the fact that the layer of iron-stone nodules successfully interferes with the free ascent of capillary water from subsoil to soil during the dry spells. In the lower part of the hundred of Mortlock there is a wide variation in the nature of the soil. As in Wanilla, there exist large areas of shallow loam overlying ironstone rubble and yellow clay; also fairly extensive areas of loose, white sandy soil, sometimes resting on yellow clay, sometimes on ironstone rubble and clay. A smaller proportion of low-lying land, evidently swampy in winter and salty in summer, exists. The land appears to improve as the northern limit of Mortlock is approached, the soil for the most part consisting of clay loam resting on a lessening quantity of rubble. In the hundred of Cummins the land appears to be more uniform in quality, and generally superior to the land in Mortlock. The yacca, forming a prominent feature in the Wanilla and Mortlock country, appears in diminishing areas, and the eye becomes accustomed to wide expanses of healthy, vigorous mallee. White, sandy loam, calcareous loam, and clay loam, on fairly strong retentive subsoil, constitute the great bulk of the country. Ironstone rubble in soil and subsoil, though occasionally present, exist in lesser quantities than in Wanilla and Mortlock. Around the terminus of the railway (Yeelanna) the land is uniformly good, resembling in its essential features the land in Cummins. The soils are deep, and appear to admit of

ready tillage. Block 36, hundred of Shannon, the site of the experimental farm, is triangular in shape and 1,164 acres in area. The prevailing scrub is mallee—6ft. to 8ft. high—and broombush, relieved occasionally by small areas of peppermint and pines. There are five leading types of soil on the block—

1. White sandy soil, of varying depth, averaging 8in. to 10in. This soil is typical of large areas of land in hundreds of Mitchell and Shannon, and, though heavy crops are rarely grown on this type of soil, the experience of the settlers seems to indicate that fairly certain crops may always be expected.

2. Reddish, loamy soil, of easy working character, usually 6in. to 8in. deep.

3. Occasional flats of reddish clay loam, much stiffer in working than the previous. Generally speaking, these two types of soil have given most satisfactory results in Shannon and Cummins.

4. Deep black loam, fairly rich in organic matter, well suited for the growth of heavy hay crops.

5. Travertine limestone areas, with frequent stony outcrops.

The prevailing subsoil is tenacious red clay of good quality. Marly subsoils are found over small areas, whilst limestone areas are not infrequent.

Arrangements have been made for the rolling and burning of 300 acres of scrub in the south-east corner of the block. This area will include for experimental purposes a fair quantity of each of the soils described above, and will be sown next season. Mr. W. T. McLean, formerly assistant manager of the Murray Bridge Experimental Farm, will manage the Shannon Farm, and will supervise from this centre the whole of the experimental work on the West Coast.

MILLING EXPERIMENTS.

The small experimental mill has been working on samples of wheat from New South Wales and New Zealand. Some extremely interesting results have been obtained, and these will be published in due course.

POTATO EXPERIMENTS.

During the past month a series of experiments with potatoes have been inaugurated at Mount Gambier. The experiments are being conducted for the purpose of determining (1) the value of a change of seed, (2) the manurial requirements of the potato, (3) the comparative value of various varieties of imported potatoes.

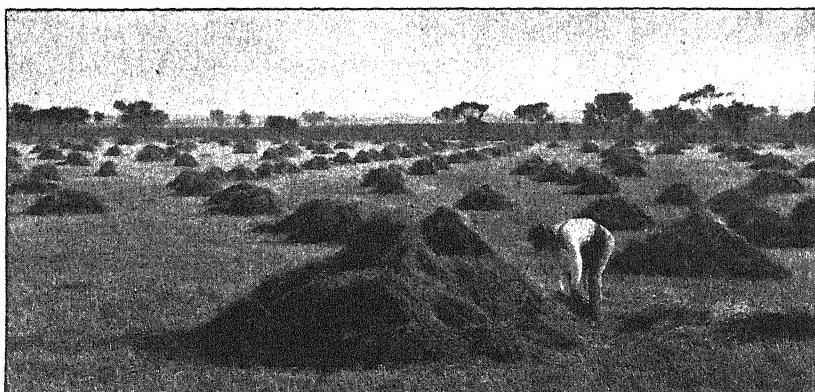
Messrs. Sassanowsky, Kilsby, and Smith have charge of the seed experiments, and the varieties selected for the purpose are Imported Snowflakes and Brown Rivers. These will be tested alongside local seed under identical conditions. The manurial experiments will be conducted by Messrs. Ruwoldt, Niquet, Cobbledick, and Kilsby, of the Mount Gambier Agricultural Bureau.

Mr. Ruwoldt's land is characteristic of the high quality black loam in and around Mount Gambier. The soil of the other three experimental plots is

inferior to Mr. Ruwoldt's, and will afford an excellent test of the requirements of the average and poorer quality land near Mount Gambier. Each of the experimenters will sow six plots of half an acre each on land specially selected on account of its even quality. The scheme of each of the plots will be as follows :—Plot 1—10 tons farmyard manure per acre ; Plot 2—no manure ; Plot 3—super., 36 per cent. to 38 per cent., 2cwt. per acre ; Plot 4—super., 2cwt., and sulphate of potash, 1cwt. ; Plot 5—super., 2cwt., and sulphate of potash, 1cwt., and blood manure, 1cwt. ; Plot 6—super., 2cwt., sulphate of potash, 1cwt., nitrate of soda, 1cwt., per acre.

A special test with farmyard manure and a complete artificial manure will be carried out by Mr. J. A. Englebrecht. Three plots of half an acre each have been marked out on rich, black soil. These will be treated as follows :—Plot 1—10 tons farmyard manure per acre ; Plot 2—unmanured ; Plot 3—complete artificial manure—super., 2cwt., potash, 1cwt., blood manure, 1cwt., per acre.

The variety experiments will be carried out by Messrs. Niquet, of Mount Gambier, and Dow, of Glencoe. Specially selected varieties of potatoes were imported from England by the department some two years ago, and these have been grown at Murray Bridge in 1907 and Stirling West in 1908 before being sent to Mount Gambier. Mr. Niquet is sowing the following varieties :—Early Regent, May Queen, Ruby Queen, Duke of York, Royal Kidney, Challenge, and Klondyke. Mr. Dow will sow Queen of Veldt, Discovery, Ninety-fold, British Queen, and Up to Date.



STOOKING HAY AT ROSEWORTHY.

THE "IRISH" POTATO BLIGHT.

By GEO. QUINN, HORTICULTURAL INSTRUCTOR.

The winter of 1909 will doubtless be long remembered by potato-growers in Australia owing to the discovery which was made almost simultaneously of the presence of this disease in the States of Queensland, Tasmania, Victoria, South Australia, and New South Wales, and at a slightly later date in West Australia. Although the complete investigation into the spread of the disease which was decided upon by the Ministers of Agriculture at their recent Conference in Melbourne has not yet been accomplished in each State, there is much reason to believe the disease is not wide-spread in any of the States. In the interests of the localities yet free, to facilitate inter-State trade, and for the purpose of attempting eradication in the affected localities, that Conference decided each State should map out its affected areas and attempt to secure legislative powers—where such are not already possessed—to prevent potatoes, either clean or diseased, being removed from such infected districts.

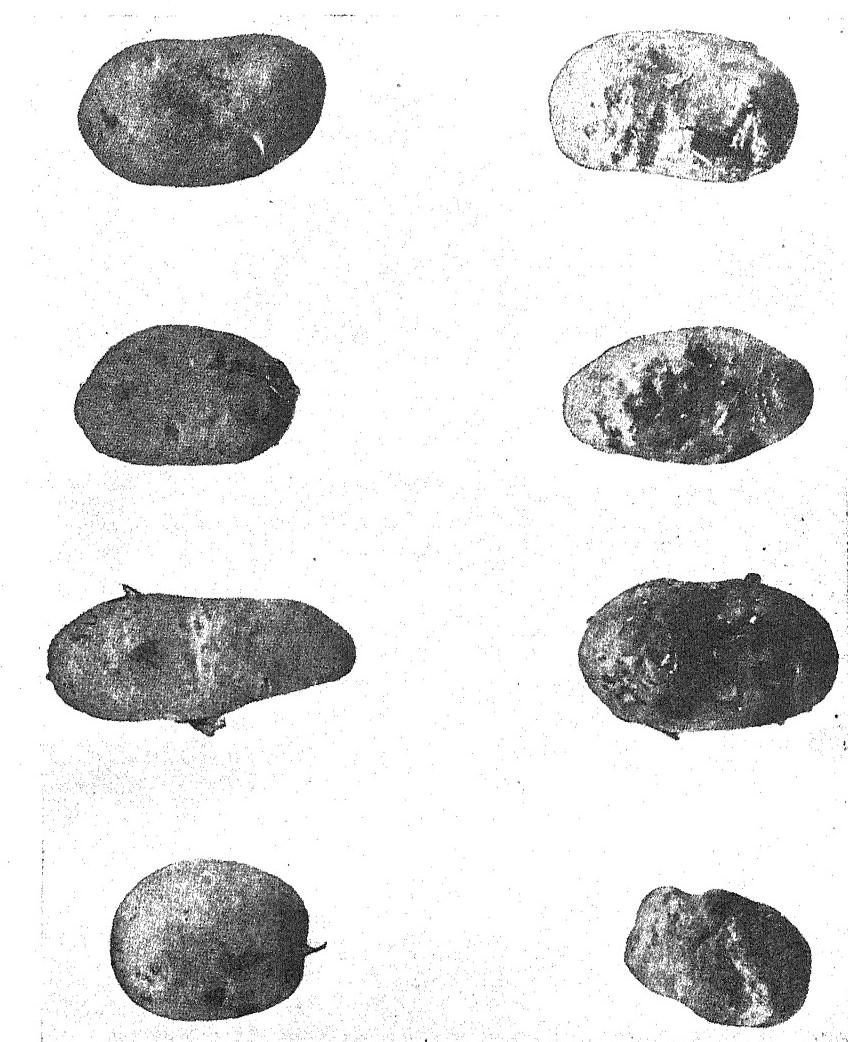
Such districts may comprise a small acreage, but a buffer area of at least half a mile in width must encircle it, wherein no potatoes or closely allied solanaceous plants shall be permitted to grow.

The so-called "Irish" blight is caused by a microscopic fungus which the great mycologist, Professor De Bary (who worked out its life history nearly half a century ago) named *Phytophthora infestans*. Like many other parasitic fungi, this one performs its insidious work for some time within the tissues of the host plant before its presence may be suspected by the gardener.

In this case the trouble almost invariably begins owing to the planting of "seed" potatoes which are affected by the dormant spawn or mycelium of the disease. The parasite being a plant, it is stimulated into activity by the same factors, viz., moisture and warmth, as those which cause the potato to put forth stems and leaves.

Ascending through the tissues of the stem the slender filaments of the fungus reach the leaves before the potato gives any outward sign of debility. Should the season prove dry the progress of the fungus is retarded to such an extent that its presence may not be suspected by the owner of the crop. If, however, frequent showers fall upon the plants, followed by heavy dews and humid atmospheres, the fungus makes great headway indeed. This takes the form of the production of myriads of microscopic spores which are borne upon minute tree-like branches which are protruded through the under surfaces of the leaves.

Owing to the almost incredulously rapid increase in number of the filaments of the fungus which are formed within the leaves and stems, at the expense of the cell sap contained therein, the life processes of these organs come to a standstill and putrefaction sets in rapidly. This is the stage when the grower begins to note black patches forming and extending, usually from the marginal tips of the leaves downwards. Providing the weather

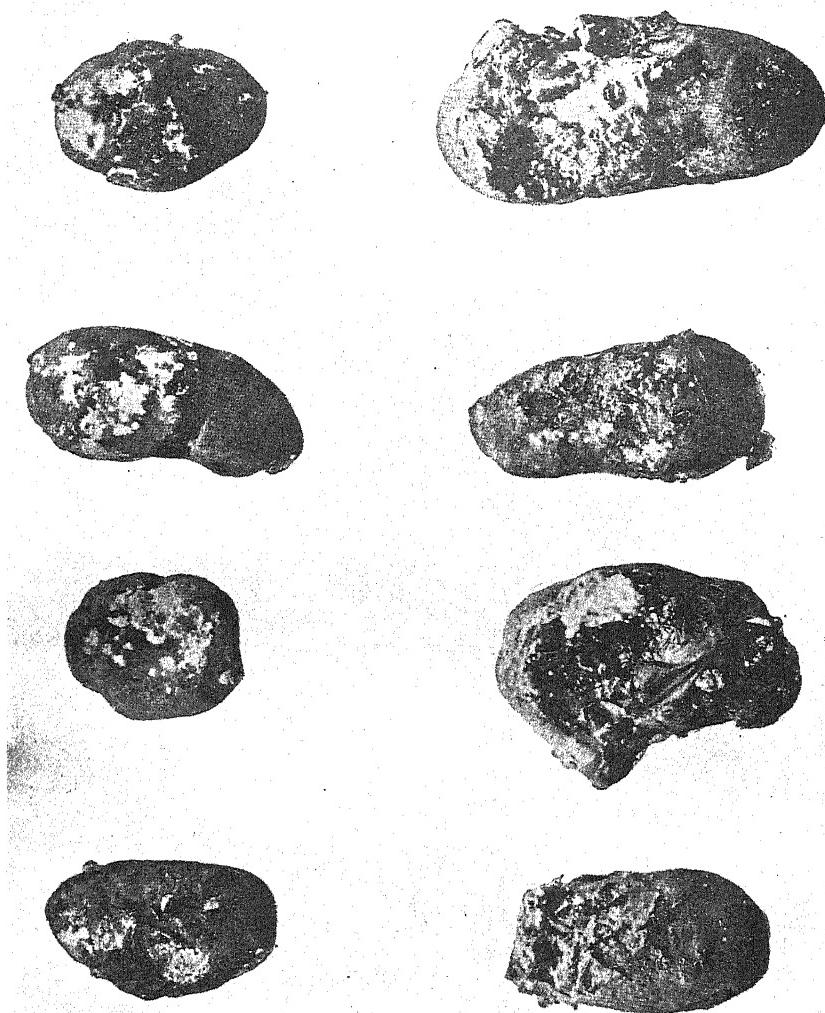


1

LATE BLIGHT, OR IRISH POTATO-DISEASE (*Phytophthora infestans*).No. 1: HEALTHY POTATOES; REDUCED. No. 2: EARLY STAGE OF THE DISEASE;
REDUCED.

2

conditions continue favorable to the disease, the patches of black dead tissue increase and spread over the whole plant with alarming rapidity, and in a few days it may become a collapsed mass of rotting, putrid, evil-smelling matter.



3

LATE BLIGHT, OR IRISH POTATO-DISEASE (*"Phytophthora infestans"*).
No. 3: LATER STAGE OF THE DISEASE THAN NO. 2; REDUCED. No. 4: LATER
STAGE THAN NO. 3—SHOWING THE GREAT DAMAGE CAUSED TO THE TUBERS; REDUCED.

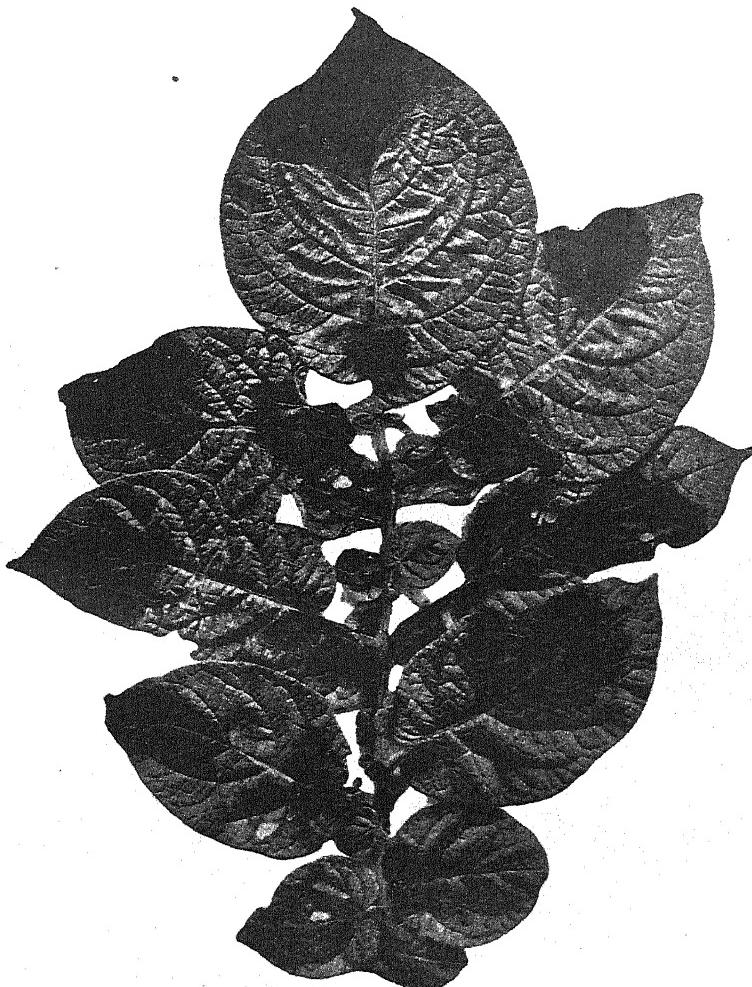
Whilst this process of decline is in progress the fungus is throwing off myriads of its spores, which, if they fall on to the moist surface of an adjoining potato leaf or plant, germinate almost immediately, and the germ tube

which sprouts from the spore finds an entrance into the tissues of its new host, setting up a fresh infection. These spores are also washed by rain down into the soil, and are said to infect the tubers if exposed close to the surface of the ground. As the young tubers are, however, intimately connected by slender underground stems with the original sprouts from the infected seed tuber, the ramifying mycelial filaments of the fungus may pass from the erect aerial stem of the potato plant along this connective into the newly-formed tubers. Likewise the potato plant, the top of which has become infected through the agency of spores given off by another plant, may have its new crop of tubers affected in a similar manner. So well provided is this fungus by nature with methods of propagating its species that the above named do not exhaust its possibilities for increase. If tubers in which the spawn or mycelium be present are left in the field undug during a wet, mild, late autumn or early winter, they become decomposed by the operations of the fungus within them.



LATE BLIGHT, OR IRISH POTATO-DISEASE (*Phytophthora infestans*). EARLY STAGE,
SHOWING CHARACTERISTIC BLACK BLOTCHES ON THE LEAF.

Again, if such affected tubers be taken from the ground at the proper time, are bagged and stacked in close masses where the atmosphere is damp, or worse still, if piled loose in pits or sheds, the disease makes progress in conformity with the warmth and moisture generated by such surroundings. This results in the rotting of great numbers of tubers which were apparently sound when stored.



LATE BLIGHT, OR IRISH POTATO-DISEASE (*Phytophthora infestans*). LATER STAGE THAN NO. I.

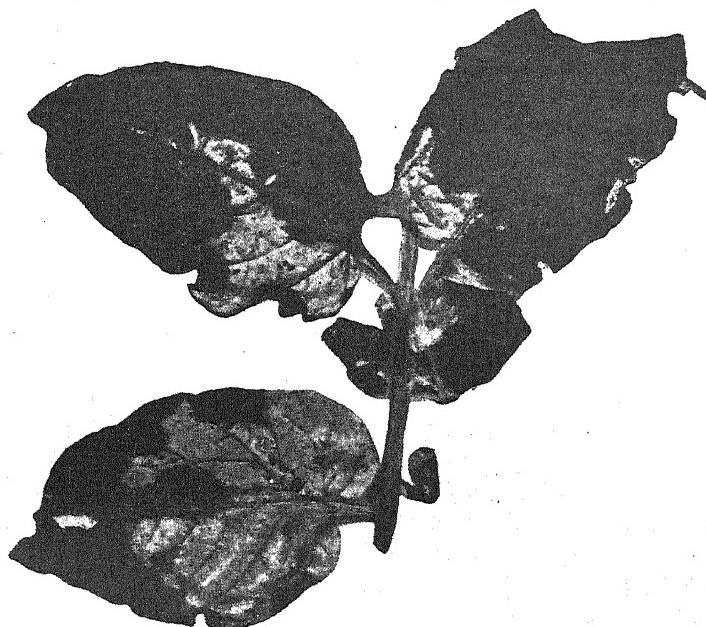
Another fungus disease known as "early" blight (*Macrosporium solani*, M. and E.), affects the foliage of the potato, and has been mistaken for the "Irish" blight by persons in this State who were content with a superficial examina-

tion only. The "early" blight causes the tissues of the leaves to discolour and decay in dark-brown patches, which are at first more or less circular in shape. Further, beyond causing the tubers to cease growing and thereby failing to develop to proper dimensions, this disease does not injure them. By destroying the tops and thus preventing the swelling of the tubers to a marketable size the "early" blight sometimes proves a serious disease, and should be combated. To the gardener, however, it is distinguishable from the "Irish" blight



LATE BLIGHT, OR IRISH POTATO-DISEASE (*Phytophthora infestans.*) SLIGHTLY LATER STAGE THAN NO. 2.

by the brown and somewhat dry patches made upon the foliage, and in the fact that it does not directly attack the tuber itself. To the microscopist the structural characters of the *Macrosporium* and the *Phytophthora* differ as widely as do those of the potato and the onion. If freshly plucked leaves carrying the black decaying patches which are typical of the "Irish" blight be closely examined on the under side the marginal surface of the black patches will show a whitish downy border. If held up between the eye and bright daylight, with the aid of a good pocket magnifying glass, the bright crystalline fructification of the fungus may be distinctly observed.



LATE BLIGHT, OR IRISH POTATO-DISEASE (*Phytophthora infestans*). LATER STAGE THAN NO. 3.

The "Irish" blight is not, as is commonly supposed, confined to the potato. It readily attacks the tomato, but, strangely enough, the fruit of this plant is chiefly affected. The petunia of our flower gardens, and many other plants of the order *Solanaceæ* have been found to form a ready host to the *Phytophthora* in other countries.

MEANS OF PREVENTION.

Procure "seed" potatoes as far as practicable from districts yet free. Cut all of the sets, discarding most rigorously everyone showing the slightest sign of sunken or brown tissue beneath the skin, as well as that peculiar marbled mottling across the newly-cut section of the tuber which has been likened to the cloudiness of a windy sky.

Disinfect the knife-blade frequently in a pickle bottle or jar of formalin solution made from $\frac{1}{2}$ oz. of commercial formalin mixed in 1gall. of water. If this is not available, use a solution of ordinary Bordeaux mixture made by dissolving 1lb. bluestone in 5galls. of water and slaking 1lb. of fresh lime in the same quantity of water, and then blending the two volumes together.

To make sure of cleansing the surfaces of the "seed," it may also be dipped in formalin or Bordeaux solutions of the above strengths and spread to dry before it is planted. If put into bags, new ones only should be used.

An effective method whereby the mycelium or spawn of the fungus which is in the tuber may be destroyed has been discovered by Jensen. It consists of subjecting the potatoes selected for planting to a dry heat of 120° Fahr. for four hours, not allowing the temperature to fall below 118° nor rise above 132°. Mr. McAlpine, the Government Vegetable Pathologist of Victoria, has verified this method, and adds that the germinating powers of the seed potatoes appeared to improve under the treatment.

The use of nitrogenous manures has, it is said, shown a marked tendency to aggravate the disease in some countries.

The practice of spraying the plants with Bordeaux mixture to protect them against infection by the spores has been accepted as a fully proved remedy.

The strength of the mixture given above may be safely used, and it should be applied to the lower as well as to the upper surface of the leaves first when the plants are from 6in. to 9in. above the ground, and again at intervals according to the prevailing weather. Two sprayings—once at the aforementioned stage, and secondly at the flowering time—have been found very efficacious under ordinarily fine weather in New Zealand.

Preventive measures, such as gathering up all old potato stalks from the ground and burning them, should be observed where any suspicion of the disease is held. Further, all diseased tubers should be either boiled or thrown into deep pits, sprinkled with quicklime or iron sulphate, and buried deeply. In no case should a criminal act of folly such as throwing them into a running stream be tolerated, neither should the potato-grower permit them to lie and rot upon the field, or upon the manure heap.

The term "Irish blight" brings up in the minds of most persons harrowing recollections of desolation and famine which they have either actually seen or read of as occurring in Ireland. That was an impression created over half a century ago, when such visitations were viewed with mysterious, not to say superstitious, awe. Since then the investigations of science have revealed the identity of the cause of the evil, and pointed out the varying phases of its life history. Other investigators, by means of carefully devised experimental tests, have discovered remedial measures such as have been detailed herein, whilst the inventive mechanic now produces appliances for distributing

such remedies which were undreamt of at the period when this pest created a national panic and helped to drive millions of persons out of Ireland.

Under the average climatic conditions which prevail in the potato-growing districts of South Australia it is possible the "Irish" blight may, if it becomes endemic, always prove troublesome to the winter-grown crops. Fortunately, however, the bulk of our potatoes are grown when the atmosphere is dry—often too dry for the wellbeing of the crops. Under such conditions there is much cause for questioning whether the disease will, other than during exceptional seasons, prove very destructive.

It is to be hoped that this somewhat optimistic statement will not be conducive to lulling the potato-growers of the State into such a sense of security that no precautionary actions on their part will be deemed necessary. There is considerable reason for assuming that this disease has been present in some localities of this State for several seasons past, and that the present one, with its mild but continuously showery weather, has provided the chain of conditions so essential to its rapid propagation.

The illustrations given herein are taken from the valuable bulletin on "Diseases of the Potato," compiled by Mr. T. W. Kirk, F.L.S., Government Biologist of New Zealand, and issued by the Department of Agriculture of that Dominion.



A HILLSIDE ORCHARD.

SPRAYING POTATOES FOR "IRISH" BLIGHT.

By W. L. SUMMERS.

The financial aspect of spraying potatoes for the prevention of "Irish" blight is one of great importance to potato-growers throughout the Commonwealth. Fortunately the practice is so general in the United States that we are able to arrive at a very fair estimate of cost and results. As results naturally vary according to the severity of the attack of the disease, which depends very largely upon climatic conditions, the experiments of one year are not conclusive. With the object of getting reliable figures on the subject, the New York Agricultural Experimental Station started a ten years' series of experiments, and the annual report for 1907 contains five years' results.



SIX-ROW POTATO SPRAYER, WORKED BY HAND.

These experiments have been carried out on two different experimental farms, and in addition arrangements were made with a number of potato-growers to carry out similar tests. In addition to Irish blight potatoes are attacked by early blight, rot, and flea beetles, and this not only necessitates earlier spraying, but also the application of arsenicals. In all experi-

ments the plots referred to as "unsprayed" were treated with arsenicals to prevent injury by flea beetles.

The potatoes are sprayed with Bordeaux mixture, made with 4lbs. bluestone for the first spraying, and 6lbs. bluestone for later spraying, 4lbs. to 6lbs. lime and 50galls. of water. The potatoes are sprayed first when 6in. to 9in. in height, and at intervals afterwards—in some cases of about 15 to 20 days, until mature, while in other three or four sprayings are given. Naturally the difference in results depends a very great deal on the season. In every case the more frequent sprayings give the biggest increase over the unsprayed, but when the disease is bad the increase is proportionately greater than when it appears in a mild form.

In the following table the results of the tests at the two experiment stations during the past five years are given:—

Summary of Five Years' Results.

Year.	Geneva Experiment Plots.		Riverhead Experiment Plots.	
	Gain per Acre due to Spraying every Two Weeks.	Gain per Acre due to Spraying Three Times.	Gain per Acre due to Spraying every Two Weeks.	Gain per Acre due to Spraying Three Times.
1902	*Bushels. 123½ 118	Bushels. 98½ 88	Bushels. 45 56	Bushels. 27½ 39½
1903	233	191	96	56½
1904	119	107	82	31½
1905	63	32	53	21½
Average	132	103½	66½	35½
In cwts.	70¾	55½	36½	19

* One bushel equals 60lbs.

It will be seen that the spraying gives much better results at Geneva than at Riverhead, doubtless due to conditions at the former station being more favorable on the whole to the development of the diseases. The difference in results due to seasonal conditions is well illustrated in this table. In 1904 the disease was very prevalent, and the results at Geneva due to spraying were 233bush. and 191bush., while in 1906, when there was a comparatively mild attack, the gain was only 63bush. and 32bush. respectively.

Cost of Spraying.

The results of the farmers' experiments contain some very interesting information on the subject of the cost of spraying on a fairly large scale. Where power sprayers were used the cost of each application averaged from 90 cents. to \$1 per acre, say 3s. 9d. to 4s. 2d. The following detail supplied by one farmer is typical of about 15 referred to in the report:—

Expense of Spraying 10·4 Acres Five Times.

234lbs. copper sulphate @ 7 cents.	.....	\$16·38
195lbs. prepared lime @ 1½ cents.	.....	2·92
90qrts. arsenite of soda solution @ 2½ cents.	....	2·10
70 hours' labor for man and horse @ 30 cents....	.....	21·00
Wear and tear on sprayer .....	.....	6·50
 Total .....	.....	\$48·90

The total expense for five sprayings was \$4·70, or 94 cents. per acre. Working on these figures we could do the work equally as cheap, if not cheaper, here, as we would not require to use the arsenite, and lime is cheaper. Local costs on this basis would work out as under :—

	£ s. d.
234lbs. sul. copper @ 30s. per cwt.	3 2 8
195lbs. lime @ 1s. per bushel	0 3 3
70 hours labor, horse and man, @ 1s. 6d. per hour	5 5 0
Wear and tear on sprayer	1 7 0
 Total	 £9 17 11

This works out at 19s. per acre for five sprayings, and of this more than half is the hire of man and horse.



ONE-HORSE SPRAYER, WORKED BY CHAIN FROM WHEEL GEARINGS

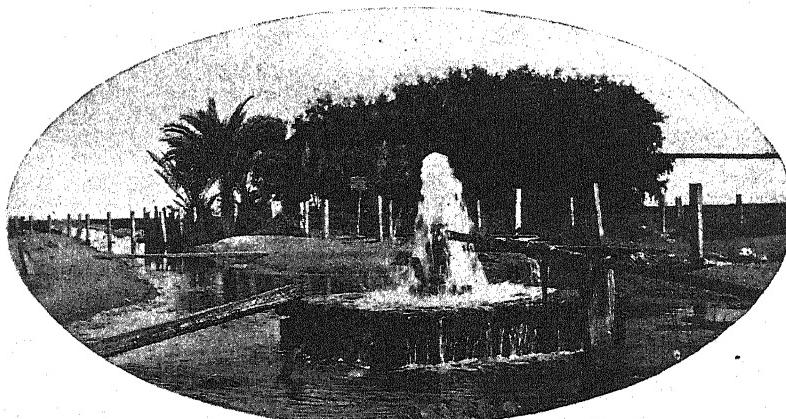
The following table shows the summarised results of all these farmers' experiments carried out during four years, 1903-6 :—

Year.	Number of Experiments.	Total Area Sprayed.	Average Increase in Yield per Acre.	Average Cost of Spraying per Acre.	Average Cost per Acre of Each Spraying.	Average Net Profit per Acre.
		Acres.	Bushels.			
1903	6	61·2	57	\$4·98	\$1·07	\$23·47
1904	14	180	62·2	4·98	.93	24·86
1905	13	160·7	46·5	4·25	.98	20·04
1906	15	225·6	42·6	5·18	.98·5	13·89

The average net profit per acre during the four years amounted to \$20·51, say £4 5s. 6d. It will be seen therefore that with proper appliances the cost is not heavy, while the profit is good. Further, under our dry conditions it is more than probable that three sprayings will be as effective as five in New York State.

Spraying Apparatus.

The spraying outfits vary both in size and general character. Some of the smallest, though mounted on wheels, are operated by hand, while some of the largest are worked by gasoline engines. Many of ordinary sizes get their power from gearings on the wheels of the spraycart. Most of the sprayers treat four to eight rows of potatoes at a time. With few exceptions Vermorel or cyclone nozzles are used to distribute the spray. Cost of outfit varies from \$50 upwards. A handy workman should be able to adapt any good local spray pump of sufficient capacity to the work of potato-spraying.



ARTESIAN BORE IN THE NORTH.

CONFERENCE OF MINISTERS OF AGRICULTURE.

IMPORTANT RESOLUTIONS.

The Ministers of Agriculture of all the States met in Melbourne during the third week of August, and the following resolutions were agreed to :—

That all fruits, vegetables, and plants exported from one State to another should be inspected on their merits.

That no State shall prohibit the importation of fruit, vegetables, or plants exported to it from another State on account of any disease affecting such fruit, vegetables, or plants which is common to both States, provided that the exporting State has adopted and is carrying out methods to suppress or cope with such diseases similar to those being carried out by the importing State.

That the inspectors stationed at Sydney by Victoria, and the one now in Victoria sent there by New South Wales be withdrawn, each State trusting to the efficiency, zeal, and *bona fides* of the other State's inspectors.

That each case containing fruit, and each bag containing vegetables (including potatoes), exported from one State to another, shall have stenciled upon or attached to it in some plain and permanent way, either the grower's or exporter's name and address, or a mark or brand, and approved by and registered with the Department of Agriculture in the exporting State.

That all cases used in inter-State trade shall be new, with the exception of the South Australian trade between Adelaide and Broken Hill. In this instance all second-hand cases shall be steamed or dipped in boiling water before being used a second time.

That only clean bags be used for vegetables, and that no bags be used a second time for vegetables (including potatoes).

That fruit found to be affected with disease be allowed to be sorted or sent to jam factories under stringent regulations; if sorted, all rejected fruit to be destroyed, and the balance to be sent to the factory or into distribution, at the option of the Chief Inspector or other authorised officer.

That every State exporting fruit, vegetables, or plants shall appoint officers to examine and inspect the same before shipment, and to give a certificate or officially stamped and signed bill of lading to the exporter that such fruit, vegetables, or plants about to be shipped are fit for export. Such certificate or stamped bill of lading shall be presented with the fruit, vegetables, or plants at the port of entry, and shall be accepted, as far as possible, as descriptive of its condition, but shall not take away the right of each State to inspect all such fruit, vegetables, or plants on landing, and to reject same if found to be diseased.

That parcels containing fruit trees shall not exceed 2cwt.

That with the exception of grape vines there shall be no restriction in the interchange of nursery stock between the States, subject to the importing State exercising its rights to inspect and fumigate the same.

That no State shall restrict the importation of fruit (other than grapes), vegetables, or plants by rail or road, but whenever one State shall make a demand for inspection of same before entry an arrangement shall be made to inspect, fumigate, &c., at a point to be mutually agreed upon, at the joint expense of the two States concerned.

That no State shall make a charge for inspection on imports which will return more than sufficient to meet the expenses incurred. In no case shall the charge, except for sorting or disinfecting, be more than 1d. per package or bunch, provided that the weight thereof does not exceed 56lbs. net.

That unless there is evidence of disease on arrival in South Australia, fruit forwarded to Broken Hill shall be allowed to pass direct through the State of South Australia, provided that it is accompanied by a certificate of freedom from disease issued by the Department of Agriculture of the exporting State.

That in making inspection of fruit the side of each case inspected shall be removed, and the fruit inspected without being tipped out of the case, unless it was found necessary to do so.

That, for the present, fruit cases be of such a size as to hold 2bush., 1bush., $\frac{1}{2}$ bush., or $\frac{1}{4}$ bush., the shapes of cases for the various kinds of fruits to be fixed by regulation, and to be uniform in all the States, but that early consideration be given to the question of introducing uniform legislation providing for the sale of fruit by weight or number only.

All destructive fruit and plant pests legislated against by the various States, with the following exceptions, shall, until otherwise notified, be deemed to be common to all States : —Pear slug or leech, San Jose scale, fruit flies, phylloxera, Irish blight, *Selandria cerasi*, *Aspidiotus perniciosus*, *ceraialis* and *tephritis*, *Phylloxera nastatrix*, *Phytophthora infestans*.

That immediate effort to secure uniform and effective legislation be made by all States with regard to potatoes and other solanaceous plants.

That each State shall subdivide its whole area into districts and take immediate steps to ascertain the extent of the prevalence of Irish blight within its borders, with a view to quarantining all districts where the disease is found to exist.

That each State shall furnish the other States with a marked map, indicating by number the respective districts, and whether they are infected or clean.

That any declared infected district shall include an area of not less than one half-mile in width immediately within its boundaries wherein potatoes or other solanaceous plants shall not be grown.

That all imports of solanaceous plants (including fruit) between the States be accompanied by a certificate, stating that such products have not been grown within an infected district.

That only new bags or cases (branded in such a way as to indicate the district in which the contents were grown), shall be accepted by each importing State.

That all the States co-operate in a series of investigations, with a view to ascertaining the origin, nature, and preventive (or curative) means of dealing with bitter pit ; also that similar co-operative work be undertaken in regard to other diseases of plants and animals.

That, in the opinion of this conference, the establishment of a Federal Bureau of Agriculture is at the present time unnecessary, and that such establishment would inevitably result in duplicating the work of the State departments.

BUREAU OF AGRICULTURE BILL.

FEDERAL LEGISLATION.

The Federal Government have introduced into the House of Representatives a measure which is entitled The Bureau of Agriculture Bill, the second reading of which was moved by the Minister for External Affairs, Mr. Groom, on August 3rd. The substance of the proposed law is contained in clauses 3 and 4, which read as follows :—

3. The Bureau of Agriculture may, subject to the regulations and to the directions of the Minister, be charged with any of the following functions :—

- (a) The acquisition and diffusion among the people of the Commonwealth of information connected with agriculture, dairying, horticulture, viticulture, live stock, and forestry :
- (b) The collection, propagation, and distribution of new and valuable seeds and plants :
- (c) The carrying out of experiments and investigations :
- (d) The investigation of pests or diseases affecting plants or live stock, and the means for preventing their spread or effecting their eradication :
- (e) The publication of reports of the experiments of experimental farms :
- (f) The publication of reports and bulletins dealing with any matter of importance in regard to production in Australia : and
- (g) Such other functions as are prescribed.

4. An arrangement may be made with the Government of any State in respect of all or any of the following matters :—

- (a) The carrying out of experiments and investigations :
- (b) The supply and distribution of information :
- (c) The exchange and distribution of seeds and plants : and
- (d) Any matters conducing to the development in Australia of the agricultural, pastoral, dairying, horticultural, and viticultural industries, and forestry.

In moving the second reading, Mr. Groom said :—"The proper sphere for the operation of the Federal Department will be the scientific work of investigation and research. In addition, the Federal Department can be of assistance in connection with the introduction of new seeds and plants from abroad, and experiments in connection with acclimatization can be carried on at any of the State experimental farms at present in existence. In most of the States at the present time there are well-equipped experimental farms. The Commonwealth need not take any action in the direction of their establishment. . . . It is not our intention to establish the Department of Agriculture on the lines of those established in America, because a great deal of work which is done by the American Bureaus is already carried out by the State Governments in Australia."

The Bill came up for consideration at the Conference of Ministers of Agriculture, held in Melbourne, August 1st, and it was resolved "That in the opinion of this Conference the establishment of a Federal Bureau of Agriculture is at the present time unnecessary, and that such establishment would inevitably result in duplicating the work of the State departments."

EGG CIRCLES.

With the object of assisting the poultry industry the Government have taken an important step in the direction of organising poultry breeders of the State, and finding markets in Australia and England for all eggs of good quality. It is proposed to do this in the first place by establishing egg circles throughout the State, and Mr. A. E. Kinnear, Accountant of the Survey Department, who has for some years taken a keen interest in the poultry industry, has been appointed Organising Secretary of what is known as the Egg Circles Branch of the Government Produce Depot. Already egg circles have been established at Tanunda (100 members), Tantanoola (30 members), McLaren Vale (30 members), Clarendon (20 members), Yorketown (30 members), Kybybolite (10 members), Millicent (24 members). These 240 members keep about 20,000 hens, and at present 3,000 dozen eggs are being received

weekly. It is almost certain, too, that circles will be established at Auburn, Naracoorte, Georgetown, the Marion district, Murray Bridge, Mount Barker, Sandy Creek, and other places. The Organising Secretary has already ascertained that big caterers in Adelaide will give 1d. per dozen extra for fresh eggs coming from circles, and there is a good prospect of opening up markets in the other States for clean fresh eggs at an enhanced price. Major Norton, who has recently returned from Sydney, has expressed the opinion that a profitable business in eggs of assured quality can be opened up there at an advance on the ordinary market price. Tenders have been called for 500 egg cases to carry the eggs that are now actually coming forward. The lid of the box is reversible, one side having upon it "Government Produce Depot," and the other having the address of the egg circle, so that no tacking of labels or addressing of boxes is necessary. The lids project an inch or two at each end of the box, and thus provide convenient handles for carrying the cases. The projecting lids also ensure proper ventilation when the cases are stacked together. The chief merit of the whole system, which has been devised by Mr. Kinnear, is the practical certainty that only eggs of good quality will be supplied. Each egg when sent in is branded with the number of the circle and the number of the member supplying it. All the eggs are tested, and should it be found that eggs of inferior quality are being received the person to blame will be discovered at once. The prospect before the poultry industry under the egg circles system seems particularly bright, consumers having the Government guarantee that only eggs of good quality will be sold to them, while the suppliers will have the satisfaction of a better price than they could otherwise obtain.

The regulations governing egg circles are as follows:—

1. Each circle must consist of not less than 15 members.
2. A committee of three and an auditor shall be elected by the members to hold office for one year, and to be eligible for re-election.
3. The committee shall elect a secretary from among the members of the circle, and the secretary shall have a deliberative vote in the affairs of the committee, and remain in office so long as he may give satisfaction to the committee. The committee shall also elect a chairman.
4. The secretary shall also act as treasurer.
5. The chairman shall have a casting vote as well as a deliberative vote.
6. The secretary shall receive the eggs from the members, and test, pack, and forward to the Government Produce Depot, Port Adelaide, or City Depot, as may be arranged. Accounts for freight to be forwarded to organising secretary for payment.
7. The secretary shall be paid by the Adelaide office for his services at the rate of $\frac{1}{2}$ d. per dozen on all eggs passed by the Government tester.
8. Suitable cases, to be branded with the name of the circle, will be lent by the Government free of cost for the first year.
9. Each member shall gather eggs every day and deliver to the secretary not less than once per week during winter months, and twice per week in the summer. Eggs must be stamped by members on large end.
10. Members must deliver to the secretary all eggs produced with the exception of those required for household and breeding purposes.
11. Each member shall deposit the sum of 5s. with the local secretary as a guarantee of *bona fides*. Such deposits to be paid into the circle's bank by the local secretary.

12. Any member may resign membership upon giving a reason which is satisfactory to the committee. In these cases the deposit of 5s. will be refunded. As it is vitally important that the circle should not be broken, any member leaving through indifference or lack of interest shall forfeit the deposit of 5s.

13. Upon delivery of eggs, the secretary shall pay cash to full local value. Price to be paid will be advised to each circle by the organising secretary.

14. The balance from proceeds of sales, less working expenses, will be remitted to the circle every three months.

15. In order to allow for payment to members on delivery of eggs during period of organisation the Government will make arrangements to provide funds free of interest for each circle.

16. Once a week, or oftener when necessary, on days to be named by the organising secretary, the secretary of each circle shall forward eggs to the Produce Depot, Port Adelaide, or City Depot, as may be arranged.

17. Immediately the organisation is complete, advances, free of interest, and the free loan of egg cases shall cease.

18. Each member will be supplied with a rubber stamp, ink pad, and egg book, the stamp to bear the number of member and number of circle, thus $\frac{2}{10}$

19. Dirty or stale eggs will not be received by the secretary. Any member who delivers dirty or stale eggs shall be warned on the first offence, for the second offence will be fined 1s., for the third 4s., and on a repetition of the offence will be expelled. Fines to be deducted from deposit. In this matter the circle committee's decision shall be final.

20. Once in every year the circle committee shall call a meeting of members. At this meeting a report and balance-sheet must be produced, new committee elected, and any other business transacted. Members may have a special meeting called at any time by requisition to the committee signed by nine members.

21. The circle committee shall meet as often as may be necessary, but not less than once a month.

22. Each circle shall be registered on the books of the department, and in his dealings the organising secretary shall communicate with the secretary of the circle. A list of members shall be supplied by the circle secretary to the organising secretary, and alterations on account of deaths, resignations, or fresh members shall be promptly advised by the circle secretary.

23. The secretary of each circle shall keep the necessary books to clearly show the dealings with each member, the business with the depot, and the deliberations of the committee. To secure uniformity all books and material will be supplied by the Government at cost price.

24. Carriage on broken eggs shall be distributed *pro rata* among the members. With the specially constructed cases the percentage should be small. The organising secretary shall advise the local secretary of all bad, cracked, or broken eggs, giving the number stamped thereon.

Whenever necessary, at a special general meeting, the members may make further rules for the government of the circle, such amendments to be confirmed by the Minister of Agriculture before being put into operation.

The above regulations, with the exception of Nos. 6, 9, 10, and 19, may be altered to suit local conditions.

The following instructions for the starting of egg circles have been drawn up:—

1. The people will hold a meeting at which they will elect a committee and auditor, and hand in their names as members.

2. The committee will elect a chairman and secretary.

3. The secretary to write to the Adelaide secretary advising the formation of the circle, and giving the names of the chairman, committee, secretary, auditor, and members.

4. The secretary to also advise the Adelaide office of the likely quantity of eggs coming forward, and the day of the week on which they will arrive in Adelaide.

5. The secretary to advise Adelaide office of the difference between Adelaide market rate and price paid locally.

6. When the above information is to hand the Adelaide office will send a man to launch the circle.

THE WHEAT COMMISSION.

THE INQUIRY CONCLUDED.

The Wheat Commission, which was appointed in January, 1908, to inquire into the conditions under which South Australian wheat is marketed, has completed its work, and has presented its final report to His Excellency the Governor. The complete recommendations of the Commission are as follows :—

PROGRESS REPORT.

1. That the Government open up communication with the Chamber of Commerce with the view (1) of arranging for the inclusion in the Corn Trade Sectional Committee of the Principal of the Roseworthy Agricultural College, and a representative farmer (to be nominated by the Advisory Board of Agriculture); and (2) of securing the fixing of the standard at an earlier date in the season than at present.
2. That an experiment in the bulk shipment of grain be conducted during the ensuing year.
3. That the Government, for experimental purposes, undertake the shipment of grain for farmers through the Produce Depot, in the same way as lambs and other produce are dealt with.
4. That parcels of wheat above the f.a.q. standard be forwarded to Europe for experimental market purposes.
5. That the Commercial Agent for South Australia in London be requested to do all in his power to increase the popularity and use of South Australian flour as a complete bread substance.
6. That, with the view to the increase of the South Australian flour trade in the East, the request of the millers for the subsidisation of a line of steamers to Manila and Java be agreed to, but only after attempts to induce the States of New South Wales and Victoria to cease subsidising vessels for a similar purpose have failed, or it appears that the Federal Government cannot or will not interfere to prevent the continuance by the two States mentioned of their present policy of subsidisation.
7. That the railway freights be reduced so as to approximate more closely to the rates in force in New South Wales and Victoria.
8. That when reductions in railway freights are arranged they should be adjusted as far as possible to avoid charges of fractions of $\frac{1}{4}$ d. per bushel from a given place to its seaboard outlet.
9. That wharfage rates on wheat landed from the River Murray at Morgan and Murray Bridge be abolished, and thus double wharfage on river wheat intended for export avoided.
10. That the work undertaken by the Department of Agriculture for the improvement of wheat by cross-fertilisation and selection, especially with a view to the increase of its flour strength, be prosecuted with vigor.
11. That arrangements be made for the earlier publication of the cables received by the Government from the Commercial Agent in London, quoting the price of wheat.
12. That the proprietors of the press be requested to add to the indebtedness of the public to them by arranging that the daily inter-State quotations for wheat should include specifically the prices of farmers' parcels on trucks at the respective shipping ports, so that a reliable comparison may be made.
13. That the inspection of shipments of wheat for Government certificates of quality should be conducted with no greater severity than is observed in the acceptance of consignments by customers in Europe.
14. That the attention of farmers be specially directed to the evidence of merchants that growers with wheat above the f.a.q. standard should protect themselves by endeavoring to make special contracts for the sale thereof with principals of trading firms and not their agents, and to the opinion of one witness that one result of the Commission would be more frequent purchases of prime wheat.

15. That farmers unable during the coming season to secure a higher price for wheat above the standard be invited to communicate particulars of their experience to the Commission.
16. That the attention of farmers be specially directed to the fact that trading firms state that they prefer that wheatgrowers should deliver their grain to them at the principal shipping ports instead of to their inland agents, and thus save the cost of agency.
17. That farmers who during the coming season deal direct with the principals of the trading firms instead of their agents, and who find the practice unsatisfactory, be invited to communicate particulars of their experience to the Commission.
18. That the various Agricultural Bureaus be specially requested to forward average samples of the new season's wheat of their respective districts to the Corn Trade Sectional Committee of the Chamber of Commerce, with the view of securing a thoroughly reliable determination of the average quality of the wheat of the State.

FINAL REPORT.

1. That arrangements be made by the Government for the fixing of a choice standard wheat.
2. That if the Chamber of Commerce decline to agree to the recommendations in the Progress Report for the enlargement of the Corn Trade Sectional Committee the Government take steps to fix an official f.a.q. standard.
3. That, with a view of securing uniformity of practice in the three States of New South Wales, Victoria, and South Australia, shunting rates be abolished in this State, provided there is a reasonable ground for believing that the producers will receive the benefit of such reductions.
4. That the Railway Department be advised to promote the erection of farmers' storage sheds in any locality by providing sites at a nominal rental, and that the Government advance the money necessary for the construction of such sheds (if requested), the amount to be repayable, with 4 per cent. interest, over a period of 10 years, the advance to be upon the guarantee of those interested.
5. That representations be made to the Federal Government that there is a general desire for the standard cornsack to be made an inch wider, so that it may hold not less than 200lbs. of wheat.
6. That the railway demurrage regulations be revised, with the view of causing less irritation.
7. That a small elevator equipment be provided at the Outer Harbor to facilitate the conduct of experimental shipments in bulk handling by the Government and by private exporters.



A CAMEL TEAM IN THE INTERIOR.

FISHY FLAVOR IN BUTTER.

INVESTIGATIONS IN AMERICA.

In discussing a circular issued by the Bureau of Animal Industry of the United States Department of Agriculture, *The Journal of the Board of Agriculture, England*, writes as follows:—

Butter, like other dairy products, sometimes suffers a depreciation in value owing to the occurrence of some undesirable flavor, one of the most troublesome, though not the most common, of which is that known as "fishy flavor." The matter was referred to in this *Journal* in July, 1904, and June, 1901, where an account was given of the investigations of Mr. O'Callaghan, Dairy Expert to the New South Wales Department of Agriculture. This writer held that the noxious fishy flavor occasionally prevalent in Australian butter was due to a small mould, *Oidium lactis*, which was said to grow conjointly with the ordinary organism which causes the souring of milk. Mr. O'Callaghan stated that he had always found the organism *Oidium lactis* present in the fishy butter examined by him, and had imparted the flavor to butter by adding pure cultures of this mould to sterilised cream.

Since that date investigations into the subject have been conducted by Mr. L. A. Rogers, Bacteriologist in the Dairy Division of the United States Department of Agriculture, who observes that the various oily flavors, which may be regarded as the most objectionable and troublesome flavors of butter, range from a slight suggestion of an oil to a strong flavor of machine oil. In the latter case the inferior quality of the butter becomes evident even to the indifferent consumer. Fishy flavor gives to butter a peculiar oily taste, suggestive of mackerel or salmon, though butter is frequently described as fishy which is merely oily or otherwise off flavor. The typical flavor of fishy butter, however, is never mistaken for any other. In one region of the United States the trouble occurs so frequently that it is spoken of in Chicago as the "fishy belt."

There are in the United States many creameries where fishy flavor appears year after year, although many of them use the most approved machinery and methods, and are managed by competent butter-makers.

Fishy flavor may develop in butter within a week or 10 days after making, or it may not appear until the butter has been several months in storage. In the warm summer months butter is frequently fishy when it reaches the commission merchant. The condition may occur in one shipment only, or

in a few tubs in a shipment, but it is not uncommon for the trouble to persist in a creamery for days or even weeks. Where this happens it is almost always during or following warm weather, and it is generally believed that fishy flavor is most common in hot, rainy seasons.

The most serious loss is caused in the case of butter held in cold storage, and, although low temperatures retard the development of fishy flavor, they do not prevent it. It was found that at 32° F. there is little retarding influence, but at 10° F. its appearance is perceptibly delayed. At 10° below zero the retardation is very marked, but even at this extremely low temperature butter may become fishy.

In the course of his experiments Mr. L. A. Rogers has been unable to confirm the results of Mr. O'Callaghan's investigations, as inoculations with *Oidium lactis* did not produce any flavor resembling fishiness. Many lots of fishy butter have been made in which this fungus was known not to occur, either in the butter or in the cream from which the butter was made. Mr. Rogers concludes that though *Oidium lactis* may be the cause of what is known as "fishy flavor" in Australian butter, and may even occasionally cause the flavor in American butter, it is certainly not the common cause in that country.

Experiment showed that fishy flavor in butter is not actually caused by anything of a basic or of an acid nature, but the results suggested an aldehyde which could be produced in a great variety of decompositions and by many kinds of bacteria. The results obtained also seemed to exclude the possibility of any direct connection between the food of the cows and the presence of fishy flavor in the butter, while it was not found possible to produce fishiness in butter when made under winter conditions. Bacteriological examinations made it evident that there were no unusual varieties of bacteria connected with the production of the bad flavor; but an analysis of all the inoculated butter which developed fishy flavor showed that this flavor always occurred in butter made with an active lactic-acid organism or in which a high degree of acidity had been developed with ordinary lactic-acid bacteria.

In all the experimental butter made in the last three years there has been no trace of fishy flavor in that made from pasteurised sweet cream churned without the addition of a starter; and, on the other hand, fishy flavor was produced with reasonable certainty by over-working the butter made from sour cream.

In conclusion, Mr. Rogers expresses the opinion that fishy flavor is caused by a slow, spontaneous, chemical change to which acid is essential, and which is favored by the presence of small amounts of oxygen. The flavor, he states, may be prevented with certainty by making butter from pasteurised sweet cream; and butter made from such cream with a starter, but without ripening, seldom if ever becomes fishy.

In Denmark the trouble is less prevalent than formerly, and this has probably been brought about, not by greater care in the selection of starters,

but by making a mild-flavored butter from pasteurised cream ripened to a low degree of acidity. The presence of *Oidium lactis* in Australian butter may be considered, not as the cause of fishiness, but merely as an indication that the butter was made from high-acid cream—a condition which is well known to favor the growth of this organism.

In considering the practical application of these investigations, it may be said that the butter-maker who receives whole milk or fresh sweet cream can prevent the appearance of this trouble with certainty. High-grade butter with a low acidity may be made by adding a good starter to pasteurised cream and churning without ripening, or the pasteurised cream may be churned sweet without the addition of any starter. In creameries receiving hand-separator cream in which the acid is well developed, the problem is more difficult, and under such conditions it may be impossible to prevent fishy flavor. The amount of working, however, which the butter receives is almost entirely under the control of the butter-maker, and overworking should be avoided.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, August 11th, there being present Messrs. J. W. Sandford (Chairman), Professor Angus, C. J. Tuckwell, T. N. Hardy, R. J. Needham, C. Willcox, Professor Perkins, Colonel Rowell, A. M. Dawkins, J. Miller, and G. R. Laffer.

Approval was given to the formation of Branches of the Agricultural Bureau at Freeling and Moonta, with the following gentlemen as members :—
Freeling—Messrs. G. A. and F. A. Block, F. H. Heinrich, J. E. Neldner, F. W. Schuster, H. Koch, R. H. Leske, A. and A. H. Mattiske, E. H. Mattiske, sen. and jun., A. Higgs, M. Shanahan, P. J. Keane, J. E. Kleinig, H. Neindorf, G. Nenke, G. R. Peters, A. and G. T. Elix, J. C. W. Steinfeldt, P. Bailey, C. G. Noske, and H. F. Wehr.
Moonta—Messrs. J. V. Kenny, C. and J. Cooper, J. M. Browning, E. H., and F. Nankivell, F. Bauer, M. J. Maloney, A. Speer, W. J. Butler, S. S. Woodward, T. Chapman, J. Hall, T. Laidlaw, F. Evans, R. H. Rodda, and D. Morris.

The following gentlemen were approved as members of the undermentioned Branches :—Balaklava, T. Lalley ; Renmark, R. Nuthall, V. P. Odgers, E. Pitt ; Brinkworth, G. E. Ottens ; Mount Pleasant, F. Fulwood, T. Phillis, D. Maxwell ; Coomooroo, W. Chapman ; Mount Gambier, P. Pritchard ; Port Germein, J. Simper ; Wirrabara, A. B. Blesing, J. F. Pitman, J. Kendrick, E. Hollett, G. Woodlands, H. Marner ; Clarendon, C. Wise and F. Sheidow ; Waikerie, F. Rogers, W. Morgan, C. H. Perry, F. Emmett ; Port Elliot, Dr. Douglas, J. Chibnall ; Tatiara, G. Steer ; Northfield, W. Reynolds ; Keith, W. and F. Kennett ; Wilmington, R. B. Scholefield ; Millicent, J. Williams ; Arthurton, T. and L. Hamlet, A. Elix ; Appila-Yarrowie, W. Seaman, C. G. Borgas, G. S. Wurst ; Cradock, R. Graham, M. Neylon, sen., M. Neylon, jun. ; Georgetown, S. Freeman, M. Clark, W. A. Piper, J. Higgins ; Lameroo, W. O'Connor, T. Gibbon, J. McMahon, M. Hannan ; Kingscote, P. J. and J. W. Hamilton ; Shannon, D. C. Dearman ; Parrakie, C. W. J. Burton ; Keith, J. H. Usher, K. C. Wylie, F. McLean, A. J. Goodhand, W. A. Camp, P. A. Crouch, H. Williams, and S. Makin.

Longwood Branch suggested that arrangements should be made to test various remedies for insect pests and fungus diseases at the Mylor Typical Orchard. Mr. Lafer said he could not quite see the object of the test. They knew that certain mixtures were effective under ordinary conditions, and to carry out tests at Mylor would only demonstrate what they knew already. It was of more importance to have the purity of these compounds tested, and the Fruitgrowers Association had already asked the Minister to do this. The Secretary said the Minister had agreed to have the various arsenical compounds tested. Members generally were of opinion that, in view of the action of the Department, the proposed tests at Mylor orchard were unnecessary.

Mr. A. E. Molineux wrote offering to the Department the books on agriculture and kindred subjects collected by his late father. The Secretary said these books had been received from Mr. Molineux, and the gift was a very valuable one. Mr. Molineux's idea was that any of these which were duplicates of those already in the library might be sent to the Agricultural College library. It was resolved that Mr. Molineux be accorded the thanks of the Board for his valuable gift.

Colonel Rowell inquired whether any steps were being taken to prevent the introduction of Tasmanian potatoes on account of Irish blight. The Chairman said he understood New South Wales and West Australia had already taken action, and Victoria intended to do so. The Secretary said that seed potatoes were coming in from Tasmania, and these were carefully examined by the inspectors. Professor Angus said that the Victorian Minister had promised to take no action to prevent Tasmanian potatoes, if clean, being landed pending the result of the conference to be held next week. The same action had been decided on in this State.

GOVERNMENT EXAMINATION OF STALLIONS.

On Tuesday, August 24th, a deputation representing the Royal Agricultural and Horticultural Society waited on the Commissioner of Crown Lands and submitted a scheme for the examination of stallions by officers of the Government. The scheme provided for the compulsory registration of stallions and compulsory veterinary examination, and the following details were suggested :—

1. That all agricultural societies receiving Government subsidies shall insist on certificates of soundness in the case of stallions three years old and over.
2. That stallion inspection parades shall be held for the purposes of examination.
3. That for this purpose districts shall be appointed. The agricultural societies in such districts shall appoint delegates to arrange such parades. The Government veterinary surgeon will attend.
4. The refusal to grant certificates of soundness shall only be in respect of whistling, roaring, cataract, ringbone, sidebone, and unsound feet. Defects the result of accident, external injury, and overstrain or work not to disqualify.
5. That particulars of horse, name, pedigree, age, &c., shall be furnished on inspection.
6. Certificates to be issued within seven days after holding parades.
7. That the results of examination may be communicated to owners on application in writing.
8. That all agricultural societies shall make it a condition of entries that a refusal of a certificate shall not constitute a legal claim against the society or veterinary surgeon.
9. Certificates to be issued in respect of stallions three years or over. Stallions to be re-examined each year until five years old, when it will hold for life.
10. That the Commissioner of Crown Lands may cause any horse to be re-examined and withdraw certificate if cause therefor.
11. That any dissatisfied owner may appeal to the Minister. Appeal to be in writing, and with a fee of 10 guineas, also undertaking to pay rail and hotel expenses of court. Appeal to be accompanied by a certificate from a veterinary surgeon that the horse is free from diseases mentioned. Appeal Court to consist of Government veterinary surgeon and two practising veterinary surgeons, and its decision to be final. No stallion refused a certificate to be submitted for re-examination except on appeal as provided.

The Minister, who had that morning returned from Victoria, where he had made inquiries with respect to a similar system in vogue there, gave a favorable reply, and stated that the Victorian Minister of Agriculture had offered to assist the South Australian Government by lending them a couple of veterinary surgeons during the rush of the show season. The Government intend to give effect to the request of the Royal Agricultural and Horticultural Society, and to make it a condition that no agricultural society shall receive a subsidy unless it adopts the practice of insisting on the examination of stallions entered for competition.

The practice of examining and licensing stallions has been in existence for many years in England, and since 1906 some of the States of America have endeavored to improve the breed of horses in the same way. The State of Wisconsin has had a stallion law in force since January, 1906, and in a bulletin issued in December, 1908, there is the following report as to the effect of the legislation :—

In order to make it possible to note correctly the effect of the stallion law, the original enactment was amended by the legislature of 1906-7 in several respects, one of them being to require the renewing of all stallion licences every two years. This provision

made it necessary that all licences issued in 1906 should be renewed in 1908 to make them good for 1908 and 1909, and, this work having been completed, it is now possible to report progress in the work of eliminating grade and "scrub" stallions. In 1906 licences were issued to 1,561 grade stallions, and of this number 553, or 35·2 per cent. have already been retired from public service. Actual records are on file to show that, of this number, 95 stallions have been castrated or their licences revoked on account of unsoundness, while 54 have died, 36 have been shipped out of the State, and 368 have not been re-licensed, their owners having decided not to use them for public service. While it has thus far been found impossible to obtain from the owners of these 368 stallions particulars as to what disposition has been made of them, it is certain that very many of them have been castrated, and that a majority of the balance have actually been retired, or have become unimportant factors in breeding, and soon will be wholly eliminated, since their licences are void and owners of licensed stallions will prevent them from using their unlicensed horses surreptitiously.

The following unsoundnesses were most commonly met with in Wisconsin as the cause for rejection and retirement of stallions:—Cataract and periodic ophthalmia (moon blindness); "roaring" and "broken wind"; chorea; bone and bog spavin; sidebone; ringbone; and curb, with curby formation of hocks.

In his reply to the deputation the Commissioner of Crown Lands stated that in Victoria recently out of 11 imported stallions six were rejected on examination. This showed that horses which had been rejected in England, and which had a good appearance, had been sent out here, and if it were not for the strict examination these animals would have spread their unsoundness in Victoria.



DONKEY TEAM AT NORTHERN RAILWAY STATION.

ALBERT MOLINEUX MEMORIAL.

The following additional amounts have been subscribed towards the proposed memorial scholarship at Roseworthy College :—

	£ s. d.
Previously acknowledged	38 8 6
A. B. Robin, Nuriootpa	0 10 0
Thos. Hardy & Sons, Adelaide	3 3 0
Wepowie Agricultural Bureau	1 0 6
Kingston Agricultural Bureau	2 2 6
<i>Garden and Field</i> newspaper	5 5 0
C. T. Jarman, Clare	0 5 0
Beetaloo Valley Agricultural Bureau	0 5 0
Port Pirie Agricultural Bureau	2 3 6
W. H. Hawke, Burnside	1 0 0
F. Masters, Percyton	1 0 0
Colton Agricultural Bureau	1 0 0
John Miller (Advisory Board)	2 2 0
Morchart Agricultural Bureau	2 2 0
M. Holtze, Director, Botanic Garden	1 1 0
J. G. Lehmann, Caltowie	0 5 0
N. E. Hewitt, Caltowie	0 5 0
J. Potter, Caltowie	0 5 0
G. Petatz, Caltowie	0 5 0
 Total to date	<hr/> <hr/> £62 8 0

THE GUANGO TREE.

Owing to a somewhat active advertising campaign being carried out by a New South Wales firm, the Agricultural Department is receiving a number of inquiries concerning the "Guango Tree" (*Albizia saman*). The circulars which are being distributed throughout the Commonwealth claim most wonderful properties for this tree. Amongst these the following may be mentioned :—It is entirely independent of rain ; it will grow anywhere in

the Commonwealth where the prickly pear, aloe, &c., will live ; it foretells with certainty a dry or wet season by its blooming ; it is never attacked by insects or even rabbits ; it supplies fodder automatically, as the pods (which constitute the fodder for stock) fall to the ground as they ripen ; increases the carrying capacity of pasture, and a few other equally valuable characteristics.

Doubtless many people will be tempted to experiment with this marvellous tree. To be independent of rain for an ample supply of fodder, and to know from the tree whether the season is going to be wet or dry is worth thousands of pounds—*if correct*. The strangest part of the business is that, although this tree has been well known for very many years, these marvellous properties only appear to have been recently discovered.

The "Guango" or "Rain tree" is a native of semi-tropical America, extending from Mexico to Brazil and Peru. It grows well in India, Jamaica, and other tropical countries. It does best in the vicinity of the sea coast ; and this fact, combined with its deep-rooting habit in countries subject to heavy dews near the coast, accounts for its reputation as a drought-resisting tree. According to Baron von Mueller the guango thrives best where the rainfall varies from 30in. to 60in. annually, and where frosts are not severe.

Our advice to readers is to waste no time or money in trying to establish this tree ; it may do all right in the northern portions of Australia, but though it will grow in the southern districts, it is exceedingly doubtful if it would pay to plant for fodder.

WHY WOOD DECAYS.

[From *Conservation*, May, 1909.]

Piles driven by the hut dwellers of the Baltic centuries ago are as sound to-day as when first placed. The wooden coffins in which the Egyptians buried their dead are still preserved in perfect condition after thousands of years of service.

The longevity of timber under these two extremes of climate and moisture conditions has naturally made people ask, What causes wood decay ? The answer is, fungi and bacteria, low forms of plant life which live in the wood and draw their nourishment from it. These organisms are so small that a microscope is required to see them, yet their work results in the destruction

of billions of feet of timber each year, and the railroad corporation, with its cross-tie bill running up into seven figures, and the farmer who spends a hundred or so dollars a year for fence posts, are alike drawing upon the knowledge of experts in all parts of the world in efforts to learn the most economical and most satisfactory method of preserving wood against the inroads of decay. In studying the means of preventing decay, wood-preserving experts have learned many things about the obnoxious fungi which sap the life of timber.

The small organisms can grow either in light or in total darkness; but all of them require requisite amounts of air, food, moisture, and heat. If one or more of these essential requirements is lacking, they cannot live, and the decay of timber will not take place. Wood constantly submerged in water never rots, simply because there is an insufficient supply of air. This condition accounts for the soundness of the old Baltic piles. On the other hand, if wood can be kept air-dry it will not decay, because there will then be too little moisture. The timber used by the Egyptians will last indefinitely so long as it is bone-dry.

There are a great many cases, however, where it is impossible to keep wood submerged in water, or in an absolutely air-dry condition. In fact, a large percentage of the timber which is used is exposed to the weather, and is subjected to decay simply because it contains enough air and enough water for the decomposing organisms to get a foothold. Decay is most serious where the atmosphere is warm and damp, because these conditions are most favorable for its development. In the coal mines of Pennsylvania timber decays in two or three years, because the temperature is warm and constant and the air is damp. And in the South, the warm, humid atmosphere often causes the timber rapidly to decompose.

Decay may be prevented by two general methods—by treating the wood with antiseptics, thus poisoning the food supply of the organisms which cause decay, and by treating it with oils which render it waterproof. A combination of these two methods is most commonly used, as when wood is treated with creosote, which fills up the pores in the timber and keeps out water and is also a powerful antiseptic.

The United States Government considers the investigations of the preservative treatment of timber of such importance that the business of one branch of a bureau in the Department of Agriculture—the “Office of Wood Preservation” in the Forest Service at Washington—is given over entirely to the work of experiments, in co-operation with railroad companies and individuals, in prolonging the life of railroad ties, mine props, bridge timbers, fence posts, and transmission poles. Advice and practical assistance is furnished all who request this advice of the forester. The lengthening of life of timber means the saving of thousands of dollars annually through doing away with the heavy expense of labor and cost of material for renewals.

THE ART OF IRRIGATION.

By T. S. VAN DYKE, in *The Irrigation Age*.

There are some soils in which water can be made to rise by a long run of water ditches so that roots from the surface can reach it. Sometimes it can be brought so near the surface that a great variety of garden stuff can be raised by it with no water ever applied to the top. A common sight in river bottoms in California is immense maize growing on rich alluvium with the water-table several feet below the surface and held there by the water flowing above ground all summer, or by the flow beneath the sand, which is common to all the rivers that run dry. Potatoes, pumpkins, melons, celery, beans, peas, and many things besides corn often grow with the water only 2ft. below the surface. Many trees, like the orange and lemon, will not endure this; but others, like the pear, do well enough provided the water is moving and is not stagnant. I have seen luscious grapes grow on the same ground, but they would not do to ship, or for wine, and probably would make a poor raisin if they did not sour in drying. Alfalfa will often grow on such ground, but not well, and will not make the huge crops it will on well-drained upland where its roots cannot touch water but plenty is applied on the surface.

On such ground nothing is necessary but to start the seed, and if it is not too hot or the air not too dry quick seeds can most always be started by the moisture which cultivation will draw up from below, though there are some soils of such even texture that no amount of cultivation will do this. The seed once started, no water is needed on the surface.

But where lands are moist from supply from a natural stream the water is generally moving. If you attempt to imitate this with a ditch on upland, where there may be no sand or gravel beds to carry off water enough to prevent stagnation, the result may be quite different. Especially if there is much iron or alkali in the soil. Iron in stagnant water is apt to injure anything whose roots get into it. Many trees endure it and look well enough, but the quality of the fruit is low and often under market size. In other things, like blackberries, the size of the plant may be the only thing affected, while the fruit is still fairly abundant and good enough for home use. In trying to moisten land by raising this water-sheet below, you never can tell what the outlet is for surplus water, and, consequently, when this stagnation will happen. In lands along a natural stream this point is well established, and if you find no stagnant water there at the outset you are likely to have none in the future. Hence you had better not attempt this kind of subirrigation, even on a small scale. I have seen it tried several times where the land lay

on a heavy slope upon rock of the same slope, from which the top soil was formed. Parties had small streams insufficient for surface irrigation, with no places to make natural reservoirs and where artificial ones would be too expensive. They attempt to slide water down the rock face below the soil by a ditch running all the time along the upper edge. The sliding part was successful enough, and the land well moistened ; but, with the exception of a few vegetables, it was not a success, although the soil was 2ft. 6in. deep, and rich and loose with vegetable mould, the whole having been covered for ages with a dense growth of heavy brush. No water could be found running out of the lever edge of the slope, and it seemed a plain case of stagnation. Trees were runty with sour fruit, alfalfa yielding about one-fourth of a crop, &c. While the principle is bad for most things, there still may be many things that could be raised to advantage on such soil where one can do no better, though you had better confine your efforts to stuff for home use.

The use of large furrows or very small ditches has nearly always been to wet the soil in the immediate vicinity of the trees or plant, without any regard to its condition a few feet away. This is common to-day in heavy market gardening by the Chinese, Italians, and others. Corn, potatoes, cabbage, and many other vegetables are grown on the ridge between two furrows made with a small plough or a shovel plough, throwing earth both ways. Down these a stream of about a quarter of a second foot is run. This generally runs fast and muddy, but the volume is so great that it soon wets the ridge well to the top. The waste is collected in a ditch below, and passed on to another tract. As soon as it is dried down to the right point the plough—generally a shovel plough—is run again in the furrow, breaking up the baking earth and throwing some fine material to the top of the ridge. It is then left in that condition until the next irrigation.

This method works quite well, the main objection being that on ground thoroughly graded, pulverised furrows, one-quarter of the depth and carrying one-twentieth of the water long enough to wet the whole ground, as in fine orchard work, will, in most cases, produce better stuff and more of it without irrigating one-half as often. Mud puddles and baked ground will not be seen and the cultivation will be much deeper and finer, with its effects more lasting. But, unless one owns the land, the grading and the regulators at the head of the streams may cost too much. These large streams can generally be handled without regulators, because the irrigator is on hand during the whole run, and if some do carry too much it is of little moment, because there is still enough left to go through. Much rougher ground can be handled in this way, because the furrows are so deep that the water cannot escape sideways, as it easily can from small furrows ; and where one can get only a short lease on land—like most of the Chinese—it may be the best thing to do, though a poor model for anything but economy.

Another use of large furrows, generally by the owner of the land himself, is much less excusable. Planting trees, vines, and vegetables along the flat shores of a little brook, or on the low banks above, is a trick almost as old as the human race. The modern man improves on this in many places by making an artificial brook more or less straight. In this he sometimes keeps water running all the time. A little corn, potatoes, beans, and other stuff may be raised in this way, if the water is not too cold. But fruit is quite sure to be insipid or sour, with no keeping qualities. To avoid this he ran water in it only once in a while, keeping it dry most of the time, but always using the same old channel without breaking it up each time by cultivation. This was an improvement in some ways, and fair fruit was grown on some soils; but on many others the tree made slow growth, while the fruit was mostly small and tough, though better, on the whole, than where the water was running all the time. This is often from lack of drainage, though there is something more the matter. Good drainage alone will not always offset the bad effects of the reliance on sufficient water which afflicts most novices in irrigation in the dry countries. I have had old settlers on the desert tell me that the only way to raise anything was to sit up nights and pour water on it. They were very much astonished to see me raise immense crops of the finest melons with watering only an hour or two once in two weeks, right under a blazing and incessant sun, with air dry enough to dry clothes in two hours at any time of night. Everyone thinks the only thing is to get on water enough and keep it there a long time. The worst fruit I ever saw was on a gravelly bar so well drained that two second feet running for days at a time on five acres left no standing water. This was about equal to 10 rain inches a day. The owner turned it out on the orchard when done irrigating alfalfa, and left it running until ready to use it again elsewhere. He had been doing so for many years, yet seemed to think it was all right because water did not stand in ponds in the orchard and the weather was so hot it must need it all. The five acres were planted with all kinds of trees, and the fruit was in every respect the sourest, flattest stuff I ever saw, in spite of the drainage being so perfect.

When cultivation came in vogue the owner of this large furrow, finding that leaving it dry for days at a time did not fully remedy the trouble, began to break up and cultivate the dry ground beyond. This helped some by retaining moisture and making it more even about the trees, because it was not so readily sapped from the dry ground as when the surface was uncultivated. One who has never tried it by digging down to examine has no conception of the rapidity with which a piece of dry ground will sap the moisture from a piece of wet ground beside it. It is still worse when the dry ground is uncultivated, and even more so when it is filled with those weeds of a dry country that will live almost dormant when the ground becomes perfectly dry, yet revive and absorb water at a furious rate when the ground becomes a little

moist. Perhaps you can do nothing more valuable at the beginning of your experience than to try this very thing so as to get a practical idea of the importance of wetting the whole ground and retaining the moisture by cultivation until the roots of your crop take it out. In no other way can it be kept even in the soil, and if not uniform, but subject to change of quantity or location, there will be more or less fluctuation in the growth of the plants. And all such fluctuation means some loss, for everything should be kept growing at its best.

But in spite of this cultivation, the results were not yet what they should be, as the irrigator soon learned by visiting some of the districts where the small furrow system was worked to its highest capacity. He learned that if he did not break up the ditch each time by cultivation that it gradually became cemented or puddled more and more at each irrigation. For the large streams running fast carried mud and silt instead of running clear, as in case of the small furrows. Thus they began at once to puddle the sides and bottom of the furrow and reduce the soaking capacity of the soil. When dry they were a channel of fine dry mud, filled with many cracks. The muddy water run in the next time filled these cracks and made the whole still tighter. The consequence often was a tree standing close to plenty of water, showing no suffering, perhaps, to a common eye, yet doing far from its best work, because there was not enough of the ground wet with the proper uniformity to give it the utmost feeding ground that a tree of its age should use. This method has now been generally abandoned by all irrigators who take the slightest pains to learn what other people have discovered. But the man who goes through the world with his nose in his own plough furrow is apt to fall into the old error. There are places where, owing to the lay of the ground and the impossibility of getting a sufficient irrigating head, one can do nothing better. But if so, he should not attempt to raise fruit for market except in some special locality like a mining region, where any kind of stuff commands a good price.

This large furrow system must not be confounded with the small furrow system, as often exhibited in pictures of irrigation. In most all of these it is simply small furrows with too much water cutting and tearing and overflowing in places, making one think the whole ranch would be carried to the sea in a few years. Sometimes this is done because the soil is so porous that small streams would not get through. But it is better to cut the tract in two and feed over again from another ditch, or lay out the whole tract in more places, each with its own distribution. The distinction is that in the small furrow system the whole ground is wet, whether properly or economically makes no difference. In the large furrow system only a part of it—often less than one-fifth—is wet. Where it wets from soaking upward from raising of a water sheet below is quite another system. Each one is bad, and should never be used where conditions do not compel it.

FEEDING OFF MAIZE WITH PIGS.

Bulletin No. 104 of the Minnesota Agricultural Experiment Station contains some interesting notes on experiments in the "hogging off of corn," and the value of pasture for pigs. By "hogging off" is meant the practice of turning the hogs into a field of growing maize, allowing them to pull down the stalks, and consume them and the corn at will. This practice was not uncommon 25 years ago in Ohio, but it was not followed generally, being condemned as a shiftless untidy method of harvesting corn, and it was also believed that hogs made better growth if yard-fed, or closely confined. In several of the maize-growing States the practice of late years has, however, been adopted on a fairly extensive scale, and during the past two or three years the Minnesota Experiment Station has been carrying out careful tests to determine the relative value of an acre of maize for pigs fed in yards and "hogged off." These experiments showed that the field lot of hogs produced pork for much less feed than did the hogs fed on ear corn. Averages for 1905 and 1906 show that 1.24lbs. less of feed (corn and shorts) were required to produce 1lb. of grain when corn was hogged off. Of this amount .36lbs. were shorts and .88 were corn. The extra requirement of about .36lbs. of shorts amounts to a great deal to the farmer who has to pay \$20.00 per ton for this feed, and even then cannot get it regularly. At prevailing prices of feed the extra amount of shorts and corn required for every pound of grain produced would cost at least from .80 to .90 of a cent. per pound. Why hogs do better in the field and make gains more economically is difficult to explain. The mineral matter and worms obtained from the soil, and freedom to exercise and eat at will, probably have a good effect upon digestion. Then, too, the ears of corn when husked become dry and hard, while those in the husk remain moist. Mastication in the case of the moist corn is easier: the hogs eat more and therefore gain more rapidly. Each year greater gains in weight were made by the field lot than by the ear corn lot. During a 50-day period in 1905 and a 52-day period in 1906, an average daily gain of 1.37lbs. was made by the field lot, 1.03lbs. by the lot fed ear corn, and 1.11lbs. by the lot fed snapped corn. The lot fed snapped corn were fed during a 52-day period in 1906 only. Comparing the field and ear corn lots, it will be noted that the former made an average of .34lbs. more gain daily. Expressed in per cent. the field hogs gained 32.05 per cent. more pounds, or almost one-third faster than the ear-corn-fed hogs. To the farmer it means that the field hogs would

gain in 75·2 days as much as the ear-corn-fed lot would gain in 100 days, or during the average hogging corn season of 66 days, about 16 days less feeding would be required to give an equal finished weight. It means that the hogs may be placed upon the market 16 days earlier; or if the owner were forced to sell on account of disease in the neighborhood, that he could sell to a somewhat better advantage, because of the probable heavier weight of his hogs. Pigs weighing from 100lbs. to 140lbs. are best suited for field-feeding, since they have at that weight formed a good amount of bone and muscle for framework, and are in a condition to fatten rather than to grow. Those that have been grown on pasture are better fitted for the work than those that have been confined in pens, as they are more active and have had more experience in gathering food for themselves. They therefore eat corn more readily and require less amounts of expensive mill feed. Shoats of this weight may be expected to gain about 1·4lbs. daily. In 60 to 70 days of feeding they should gain approximately 92lbs. It is generally conceded that good pastures furnish by far the cheapest feed for growing animals on land not exceeding \$100·00 per acre in value. The truth of this argument is quite evident when it is considered that the feed as obtained by the animal is in the very best condition. That is, it is succulent, contains all the nutrients in an easily digestible form, and is obtained by the animal under very healthful conditions. In addition to this, the cost of harvesting, curing, stacking, and feeding is eliminated. On land worth \$70·00 per acre a cow can be pastured for less than 5 cents. a day, while at the present price of grain and hay it costs on the average from 8 to 12 cents a day to feed the same cow in the barn. Experiments show that as much pork can be made from one acre of good pasture as from one ton of shorts or corn. The cost of these feeds varies from \$15·00 to \$20·00 per ton. An acre of pasture will save then from \$15·00 to \$20·00 worth of feed. It is quite evident that in the economical production of animal products good pastures are an important factor. The reason more and better hog pastures are not used is chiefly due to the fact that hog fences are quite expensive, The advent of the woven fence is overcoming this feature, and now land may be fenced hog tight at an annual cost of from \$1·00 to \$2·50 per acre, depending on the size and shape of fields fenced and cost of posts. Comfort is highly essential to the growth and well-being of pigs; and while they are out in the fields shelter of some sort must be provided for them. Early in the season a bed of straw answers the purpose very well, but later, when the chilly rain begins, more protection is necessary. Where hogs are near enough to permanent buildings, so that they can enter them at will, no temporary buildings will, of course, be provided.

IMPORTS OF AGRICULTURAL PRODUCE INTO GREAT BRITAIN, 1908.

[Extract from the *Journal Board of Agriculture*, January, 1909.]

The total value of the principal articles of food imported into the United Kingdom in 1908 was £183,699,000, as against £188,353,000 in 1907 £181,604,000 in 1906, and an average of £177,047,000 in the three years 1903-5.

CATTLE AND BEEF.—The importation of live cattle for food, which fell off in 1907, experienced a further decline in 1908. The important character of this change in the trade may be judged from the fact that the value of imported cattle in the past year was only £6,549,000, as against £9,732,000 in 1906. The decrease in the imports of cattle from the United States was accompanied by a marked falling off in the receipts of fresh beef from the same country, so that the supplies of the better qualities of imported beef, viz., port-killed and chilled American, were decidedly small. To some extent this was compensated for by a great extension in the shipments from Argentina, which now, in point of quantity, holds the premier position in the beef trade. During the past year Argentina sent no less than 3,590,000cwt., as against 2,692,000cwt., in 1907, while the contribution of the United States was only 1,432,000cwt., as against 2,417,000cwt. in the previous year. The difference in quality may be judged by the fact that the average value of the River Plate beef was 3*s.* per cwt., while that sent from the United States is returned at 45*s.* 8*d.* per cwt. These figures were 2*s.* or 3*s.* higher than those of the previous year. The imports of fresh beef amounted in all to 5,632,000cwt., while the weight of beef represented by the imports of cattle may be estimated at 2,483,000cwt.; so that the total receipts of meat of this class from abroad in 1908 were 8,115,000cwt., or about 20*lb.* per head of the population. In 1907 the figures were 8,806,000cwt., representing 22*lb.* per head, and in 1906 9,170,000cwt., equal to 23*lb.* per head.

SHEEP AND MUTTON.—Imports of fresh mutton reached a total of 4,391,000cwt., while live sheep represented 43,100cwt.

PORK PRODUCTS.—Of fresh pork, imports amounted to 572,222cwt., showing a slight increase; salt pork 270,628cwt., also a slight increase; bacon 5,685,742cwt., compared with 5,365,605cwt.; ham 1,225,227cwt. The total value of the pork, ham, and bacon amounted to £19,225,534.

RABBITS to the value of £685,448, and poultry and game to the value of £1,053,299 were imported.

TOTAL IMPORTS OF MEAT.—Converting the live animals into their equivalent weight of meat, and adding the total imports of dead meat of all kinds (excluding poultry and game), it appears that this country consumed, in addition to the home supply, some 22,205,000cwt., compared with 22,586,600cwt. in 1907. The total value credited to the different kinds of live and dead meat, including poultry, was £49,489,000, as compared with £51,888,000 in 1907, and £52,026,000 in 1906.

IMPORTS OF GRAIN AND FLOUR.

Description.	Quantity.		Value.	
	1907.	1908.	1907.	1908.
Wheat	ewts. 97,168,000	ewts. 91,132,705	£ 37,346,548	£ 38,295,940
Wheat meal and flour	13,297,366	12,969,855	6,694,082	7,075,231
Barley	19,627,620	18,137,200	6,564,670	6,113,945
Oats	10,485,290	14,271,150	3,383,553	4,162,775
Oatmeal	638,702	500,698	479,352	416,134
Maize	53,379,950	33,841,000	14,604,504	10,388,061
Maize meal	658,654	452,410	213,581	159,484
Peas	1,245,670	1,060,999	602,648	538,315
Beans	799,569	1,043,997	290,693	373,018
Other corn and meal	1,588,958	1,618,181	644,591	682,289
Total	—	—	70,824,222	68,205,192

The leading sources of supply of wheat were :—Argentina (31,680,000cwt.), United States (27,123,000cwt.), Canada (14,442,000cwt.), Russia (4,610,000cwt.), and Australia (5,518,000cwt.). India, which is usually a leading exporter, sent less than 3,000,000cwt. The receipts of flour from the United States were maintained at nearly the same level as in the two preceding years, 9,781,000cwt. coming from this source, compared with 9,325,000cwt. in 1907, and 9,809,000cwt. in 1906.

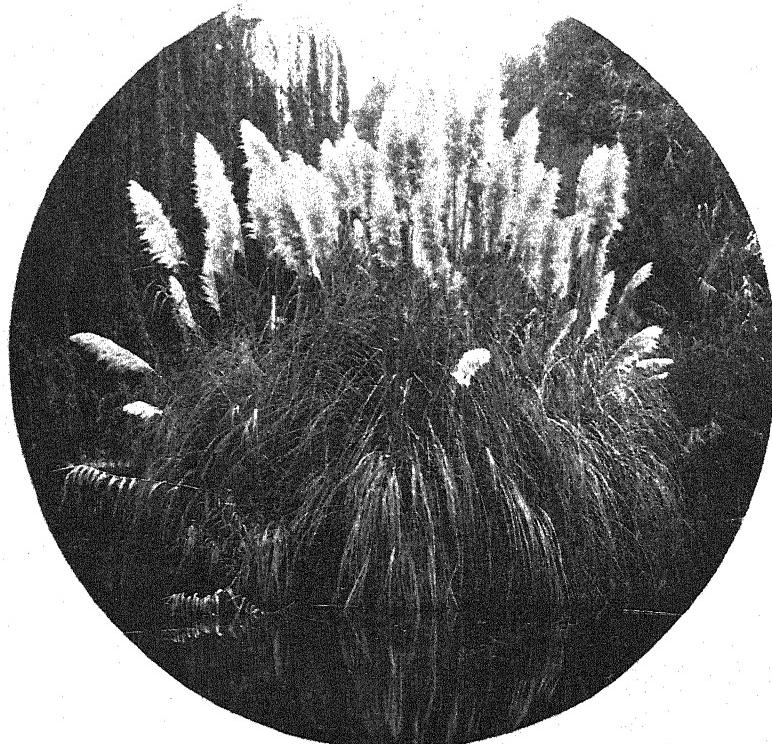
The total value of the grain and meal of all kinds imported was £72,735,000, as compared with £75,409,000 in 1907.

BUTTER.—Of all the imported foodstuffs, butter accounts for a larger sum of money than any other single item, except wheat, and the declared value of the supply of this product as it reached our shores in 1908 amounted to £24,083,000. Denmark is by far the largest exporter to this country, and furnished 1,857,000cwt., which was slightly above the figure for 1907. Russia was the next largest exporting country, and supplied 639,000cwt. The colonies of Victoria, New South Wales, Queensland, and New Zealand sent only 621,000cwt., as against 901,800cwt. in 1907, and 857,500cwt. in 1906, while the amount credited to Canada was unimportant compared with some previous years. Perhaps the most noticeable feature was the substantial advance made by Holland and France, the former country sending

244,000cwt., as against 168,000cwt. in 1907, and the latter 395,000cwt., compared with 281,000cwt. in the earlier year. The average value of the imported butter was 114s. 4d. per cwt., compared with 106s. 6d. in 1907, and this is a higher figure than any previously recorded.

CHEESE.—Imported cheese comes very largely from Canada, that country supplying 1,542,000cwt. out of a total of 2,306,000cwt., or nearly two-thirds. New Zealand, however, is beginning to secure a position in this trade, the imports having grown from 56,339cwt. in 1903 to 265,000cwt. in 1908.

Eggs.—No very great change took place in the egg trade, the total imports being 18,210,000 great hundreds, compared with 18,568,000 great hundreds in 1907. Russia is the principal source of supply, and furnished 7,062,000 great hundreds, while Denmark and Germany accounted for 3,916,000 and 2,370,000 great hundreds respectively. The average value of eggs from all countries was 7s. 10 $\frac{3}{4}$ d. per 120, as against 7s. 8 $\frac{1}{4}$ d. in 1906.



VALUE OF HUMUS.

The organic matter content of soils influences to a large extent the amount of moisture which they will hold. It not only increases the water capacity of all soils, but when mixed with close-grained ones it makes them looser, so they will absorb rainfall more rapidly. In sand soils it retards absorption and percolation slightly, thus increasing the water capacity. It checks capillary movement in all soils, and produces better physical conditions, making it easier to work and bring about by tillage conditions that tend to conserve moisture.

The power of organic matter to increase the water capacity of soils was shown by a simple experiment of putting 100ozs. of dry, medium sand in a tube with a perforated bottom, and pouring water through it and allowing it to drain. It was found that the 100ozs. of sand retained 13·3ozs. of water. A mixture of 5 per cent. of organic matter and 95 per cent. of sand was then made. One hundred ounces of the mixture retained 18·6ozs. of water. A mixture of 10 per cent. of organic matter and 90 per cent. of sand retained 24·7ozs. In experimenting with soils in the laboratory it was found that an increase of 1 per cent. in the organic matter content of soils deficient in it gave an increase of from 1·2 per cent. to 1·5 per cent. in the moisture capacity of the soil, and from 4 per cent. to 5 per cent. of organic matter gave the largest increase in the moisture capacity of the soil per unit of organic matter.

In Bulletin 41 of the Minnesota Station, Professor Snyder gives the following moisture content of two soils that had been cropped for different lengths of time:—

	Humus.	Moisture.
Per cent. of humus and moisture in surface foot of new soil, cultivated for two years	3·75	16·48
Per cent. of humus and moisture in surface foot of old soil, cultivated for 22 years	2·50	12·14

This gives a difference of 85 tons of water per acre-foot in favor of the soil having the greater amount of organic matter, or three-fourths of an inch of water.

In the vicinity of the University of Illinois two types of soil are found that differ in their amounts of organic matter. The two are separated by a very sharp line, and, in 1905, while a field containing both types was in corn, the moisture content of the two soils was determined each week from May 5th,

when the corn was planted, till September 15th, when it was mature. The results are as follows :—

	Per Cent. of Organic Matter.	Average per cent. of Moisture for Season.	Excess of Water in tons over Grey Silt Loam.
<i>Brown silt loam—</i>			
Surface, 0in.-7in.	3.89	21.23	43
Subsurface, 7in.-19in.	2.09	20.47	39
Subsoil, 19in.-40in.	1.21	23.17	147
<i>Grey silt loam—</i>			
Surface, 0in.-7in.	1.85	17.36	—
Subsurface, 7in.-19in. ....	.98	18.57	—
Subsoil, 19in.-40in. ....	.87	19.24	—

This gives an average difference between the two types of soil for the season of 229 tons per acre, or slightly more than 2in. of water in the first 40in. of soil—enough to produce 11bush. of corn. The actual difference in yield was 20bush. per acre.

Organic matter is the only physical constituent in a soil that varies. The amount of sand, silt, or clay will always be the same ; but the organic content may be increased or diminished, according to the method of farming practised. For the effect on moisture alone the organic matter constituent should be maintained, by all means ; but when we take into account the fact that it is the source of the nitrogen for most plants, and probably much of the phosphorus for all plants, it becomes of double importance.

Professor Snyder, of Minnesota, says :—"A soil which by long cultivation has lost one-half of its organic matter shows a loss of 10 per cent. to 25 per cent. of its water-holding power."

Professor Witycombe, of the Oregon Experiment Station, in speaking of the semi-arid region in eastern Oregon, says :—"While from 8in. to 12in. of precipitation may be sufficient to produce a good crop of wheat now, later, when the organic matter becomes reduced, a great deal more moisture will be required, as the soil will be less capable of retaining moisture."—*Extract from the Sixteenth Biennial Report of the Kansas (U.S.A.) State Board of Agriculture.*



HAYFIELD NEAR ADELAIDE.

THE WHEAT MARKET.

The price of wheat, which was reduced from 4s. 9d. to 4s. 8d. on August 6th, dropped to 4s. 6d. on August 10th, and it has remained at that figure since. A good many farmers sold early in the season, and they consequently took 1s. a bushel less than was obtained four or five months subsequently. The following table, which gives the average price of wheat in Adelaide each month and each year for the last 11 years, shows that only once since 1898 have farmers received more for their wheat than the price which has ruled during the present season.

Month.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	2 7	2 8	2 10	2 11	5 10	2 10	3 5	3 3	2 10½	4 2	3 8
Feb. ...	2 8	2 8½	2 8½	3 2	5 10	3 4	3 5	3 2	2 11½	3 10	3 10½
March. .	2 7½	2 8½	2 8½	3 5	5 10	3 1	3 3	3 2	2 11½	3 10½	4 2½
April...	2 8	2 8½	2 8	3 9	5 8	2 10	3 3	3 2½	3 1½	3 10	4 9
May ...	2 8	2 8½	2 10	4 0	5 4	2 11	3 3	3 3½	3 7½	4 1	4 10½
June ..	2 10	2 10	2 9	3 10½	5 4	2 11	3 4	3 3	3 7	3 9½	4 10
July ...	2 11	2 11	2 10	4 1	5 4	3 1	3 4½	3 3½	3 9	3 8½	4 10
August	2 10	2 10	2 10	4 4	5 4	3 5	3 4	3 2½	3 9½	3 10	4 6½
Sept. ...	2 11½	2 10	2 10½	4 7½	4 10	3 6	3 7½	3 2	3 11	3 10½	—
October	3 1	2 8½	2 10½	4 9	5 0	3 4	3 7½	3 1	4 9	3 9½	—
Nov. ...	2 11	2 8½	2 10½	5 1	3 3	3 3	3 8	3 0½	4 5	3 9½	—
Dec. ...	2 7½	2 9	2 9	5 1	2 11	3 8	3 5	3 0	3 11½	3 9	—
Average Price for each year	{ 29	2 9	2 9½	4 1	5 0½	3 2	3 5	3 2	3 7½	3 10½	—

Seeing that the Port Adelaide price is now governed by Australian conditions instead of by the English market, one cannot foresee any reason for another drop in the local market. On the other hand, the shortage of stocks may lead to an increase in the price. After allowing 4,000,000bush. for food and seed, the *Advertiser* estimates that there are 2,319,644bush. left for export, including a "carry over" of 2,200,000bush. The vessels to be loaded this month are estimated to take 1,000,000bush., leaving a small "carry over" of 1,319,644bush., assuming that there are no other exports. Victoria is said to be equally short, and New South Wales and Queensland have nothing to export. If stocks are as short as the figures lead one to suppose, the few farmers who still hold some of their wheat need not fear lower prices until the new crop arrives, and possibly not then.

One interesting feature of the table of prices on the next page is that it shows that on September 7th the Melbourne quotation was from ½d. to 1d. under the Port Adelaide price.

Date.	LONDON (Previous Day).						MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
	Per Bushel.	4/8	4/8	4/9	4/8 to 4/8½	4/8 to 4/8½		
Aug. 7	Dull and neglected ..	..	..	..	..	..	..	5/1 to 5/2 (s.)
9	.....	..	..	..	..	..	..	5/- (b.)
10	Dull; 5/3½ off coast ..	..	..	..	4/6	..	4/8; 4/8½ parcels	5 1/2 to 5/2 (s.)
11	Dull and neglected ..	..	..	..	4/6	..	4/8 to 4/8½	5 1/2 to 5/2 (s.)
12	Very dull ..	..	..	..	4/6	..	4/8 to 4/8½	5/2 (s.)
13	Dull and neglected ..	..	..	..	4/6	..	4/8 to 4/8½	5/2 (s.)
14	Dull and neglected ..	..	..	..	4/6	..	4/8½ (b.) ; 4/9 (s.)	5/2 (s.)
15	.....	..	..	..	4/6	..	4/8 ex store ..	5/- (s.)
16	Firmer ..	..	..	..	4/6	..	4/8 ..	5/- (s.)
17	Very dull ..	..	..	..	4/6	..	4/8 to 4/8½ parc. (s.)	5/- (nom.)
18	Very dull ..	..	..	..	4/6	..	4/8 to 4/8½ parc. (s.)	4/11 to 5/- (nom.)
19	Very dull ..	..	..	..	4/6	..	4/8 to 4/8½ parc. (s.)	4/11 to 5/-
20	Firmer; improved demand ..	..	..	..	4/6	..	4/7 to 4/7½ ..	5/-
21	Steady, quiet ..	..	..	..	4/6	..	4/7 (s.) ..	4/11 to 5/-
23	.....	..	..	..	4/6	..	4/7 parcels ..	4/11 to 5/-
24	Dull and neglected ..	..	..	..	4/6	..	4/6½ to 4/7 ..	4/11 to 5/-
25	Very dull ..	..	..	..	4/6	..	4/7 ..	4/11 to 5/-
26	Dull ..	..	..	..	4/6	..	4/6¾ to 4/7 ..	4/11 to 5/- (nom.)
27	Very dull ..	..	..	..	4/6	..	4/6 to 4/6½ ..	4/11 to 5/-
28	Dull ..	..	..	..	4/6	..	4/6 ..	Market inactive
30	.....	..	..	..	4/6	..	4/6 to 4/6½ ..	4/10 to 4/11
31	Dull, with easier tendency ..	..	..	..	4/6	..	4/6 ..	4/9 to 4/9½ ..
Sept. 1	Quiet ..	..	..	..	4/6	..	4/6 ..	4/11 p. (s.) ..
2	.....	..	..	..	4/6	..	4/6 ..	o.s. 4/11 p. n.s. 3/9½
3	.....	..	..	..	4/6	..	4/6 ..	to 3/10 (b.)
4	Steady, quiet ..	..	..	..	4/6	..	4/5 to 4/5½ ..	n.s. 3/9½ to 3/10 (b.)
6	Very dull ..	..	..	..	4/6	..	4/5 to 4/5½ ..	..
7	.....	..	..	..	4/6	..	..	..

Passengers.—Steamer: Port Adelaide to London, 20/- per ton (6½d. per bushel); Port Adelaide to Sydney, 10/6 a ton (3½d. per bushel); Port Adelaide to Melbourne, 8/- a ton (2½d. per bushel).

Sailor.—Old seasons: South Australia to South Africa, 17/6 (6½d.); South Australia to United Kingdom or Continent, 21/3 (6½d.). New seasons: South Australia to United Kingdom or Continent, 22/6 (7½d. per bushel), according to age; usual options.

RAINFALL TABLE.

The following table shows the rainfall for August, 1909, at the undermentioned stations, also the average total rainfall for the first eight months in the year, and the total for the eight months of 1909 and 1908 respectively :—

Station.	For Aug., 1909.	Avg'e. to end Aug.	To end Aug., 1909.	To end Aug., 1908.	Station.	For Aug., 1909.	Avg'e. to end Aug.	To end Aug., 1909.	To end Aug., 1908.
Adelaide	5.59	15.01	20.13	16.91	Hamley Brdg.	4.61	11.58	15.58	10.79
Hawker	2.15	8.25	12.26	7.91	Kapunda	4.77	13.83	19.79	11.09
Cradock	1.76	7.31	10.38	5.92	Freeling	5.00	12.52	16.52	11.30
Wilson	1.99	8.00	10.92	7.74	Stockwell	4.53	14.23	17.95	12.40
Gordon	1.62	5.97	10.27	7.67	Nuriootpa	5.66	14.96	20.70	13.54
Quorn	2.35	9.54	12.92	9.03	Angaston	5.23	15.25	21.52	14.71
Pt. Augusta .	2.14	6.23	10.23	7.34	Tanunda	5.39	15.64	22.29	13.38
Pt. Germein .	3.06	8.59	12.50	11.18	Lyndoch	5.47	16.34	20.63	16.25
Port Pirie	2.46	8.87	10.92	10.34	Mallala	4.85	11.87	15.48	12.45
Crystal Brook .	4.40	10.46	15.05	12.96	Roseworthy .	4.59	12.25	16.67	11.38
Pt. Broughton .	4.06	9.96	13.13	10.46	Gawler	5.29	13.68	19.50	12.90
Bute	4.94	10.91	13.39	13.03	Smithfield	4.83	11.76	16.40	13.90
Hammond ..	2.09	7.37	11.97	10.94	Two Wells....	4.88	12.16	14.13	11.19
Bruce	1.77	6.14	9.29	13.53	Virginia	5.31	12.65	17.00	12.90
Wilmington .	3.23	12.36	17.47	14.59	Salisbury	5.46	13.36	17.41	13.24
Melrose	4.47	16.11	25.00	24.16	Teatree Gully .	6.60	20.16	29.05	26.27
Booleroo Cntr.	3.17	10.76	14.89	11.58	Magill	6.71	18.62	27.78	22.50
Wirrabara ...	3.53	13.00	20.39	11.38	Mitcham	6.01	19.72	23.37	15.93
Appila	3.24	9.94	13.73	11.92	Crafers	11.24	34.03	51.38	37.91
Laura	4.33	11.99	20.01	16.54	Clarendon	7.10	24.98	32.85	23.17
Caltowie	3.96	11.34	14.82	14.17	Morphett Vale .	5.19	17.05	22.71	15.33
Jamestown .	4.51	11.38	15.91	11.58	Noarlunga	5.82	14.84	21.20	16.02
Gladstone ..	3.33	10.53	13.18	13.60	Willunga	5.96	19.06	27.07	16.40
Georgetown .	3.75	12.56	14.85	12.79	Aldinga	5.56	14.97	21.54	13.52
Narridy	3.82	11.63	13.05	12.17	Normanville .	4.04	15.32	19.28	13.05
Redhill	4.78	11.57	16.19	15.05	Yankalilla	5.34	16.62	20.00	15.73
Koolunga	4.69	10.92	15.08	13.86	Eudunda	5.16	11.74	12.93	10.65
Carrieton ..	2.30	8.12	12.50	8.05	Sutherlands ..	3.54	—	9.69	—
Eurelia	2.37	8.83	11.88	10.98	Truro	5.32	13.58	19.65	12.64
Johnsbury ..	1.34	6.49	9.95	5.42	Palmer	3.67	—	13.34	10.09
Orroroo	2.07	9.34	12.28	9.15	Mt. Pleasant .	6.50	19.44	24.29	19.48
Black Rock ..	2.23	8.13	12.59	8.55	Blumberg	7.03	21.74	26.90	22.66
Petersburg ..	2.67	8.55	11.38	8.84	Gumeracha ..	8.41	24.05	35.19	24.31
Yongala	3.06	9.11	12.05	8.59	Lobethal	8.25	26.23	35.92	24.79
Terowie	2.79	8.86	11.27	9.17	Woodside	8.86	22.67	33.36	24.36
Yarcowie....	3.53	9.11	12.78	8.82	Hahndorf	8.43	25.58	33.04	24.90
Hallett	3.21	11.08	12.14	10.76	Nairne	6.74	20.63	29.30	19.22
Mt. Bryan ..	3.56	10.77	12.36	8.04	Mt. Barker ..	6.85	22.32	29.85	19.38
Burra	3.64	12.25	15.50	11.94	Echunga	8.08	23.54	35.91	12.21
Snowtown ..	4.74	11.07	15.09	15.74	Macclesfield ..	7.23	21.70	31.74	20.40
Brinkworth ..	4.26	10.17	13.63	13.69	Meadows	7.54	25.51	35.53	23.61
Blyth	4.97	11.31	16.97	14.11	Strathalbyn ..	6.22	13.57	21.59	13.16
Clare	6.59	17.11	23.31	18.23	Callington ..	4.95	11.21	14.98	9.83
Mintaro Cntr.	6.35	15.37	21.25	14.89	Langhorne's B .	2.51	10.66	12.75	8.87
Watervale...	7.92	19.38	26.20	19.99	Milang	3.98	12.14	14.44	11.16
Auburn	7.92	16.94	28.07	17.22	Wallaroo	5.44	10.07	14.51	12.51
Manoora	5.40	12.45	16.64	11.78	Kadina	5.31	11.63	16.09	11.87
Hoyleton....	5.73	12.93	16.09	12.46	Moonta	4.81	11.16	16.20	12.25
Balaklava ..	4.43	11.21	14.10	12.91	Green's Plains ..	5.47	11.48	16.29	15.13
Pt. Wakefield ..	4.35	9.50	11.19	11.37	Maitland	6.93	14.82	20.16	15.12
Saddleworth ..	4.77	14.08	16.93	12.31	Ardrossan ..	4.98	10.09	13.32	13.71
Marabel ...	5.68	12.32	20.58	12.23	Pt. Victoria..	5.01	11.17	13.80	12.24
Riverton ...	5.13	14.40	20.17	12.70	Curramulka ..	5.02	13.81	17.05	10.65
Tarlee	4.00	12.16	16.68	9.81	Minlaton	4.45	13.09	15.29	10.96
Stockport ...	4.13	11.22	14.39	9.47	Stansbury	4.28	12.42	16.20	11.84

RAINFALL TABLE—*continued.*

Station.	For Aug., 1909.	Avg'e. to end Aug.	To end Aug., 1909.	To end Aug., 1908.	Station.	For Aug., 1909.	Avg'e. to end Aug.	To end Aug., 1909.	To end Aug., 1908.
Warooka ...	4-13	13-34	14-07	12-51	Bordertown .	3-28	13-47	16-22	10-82
Yorketown .	4-13	12-98	14-12	10-64	Wolseley	4-64	11-85	17-19	10-31
Edithburgh . .	3-19	12-19	13-25	10-37	Frances	4-69	13-61	16-76	10-19
Fowler's Bay .	3-11	9-60	10-10	10-51	Naracoorte	4-01	15-56	19-80	13-00
Streaky Bay .	4-10	11-86	15-27	12-27	Lucindale	4-46	16-57	11-73	14-76
Pt. Elliotson .	4-62	12-66	15-58	14-24	Penola	5-51	18-71	13-12	15-83
Pt. Lincoln .	3-32	15-16	15-43	13-96	Millicent	5-44	21-43	30-95	21-22
Cowell	2-88	8-31	7-72	11-04	Mt. Gambier	5-18	22-44	31-52	20-57
Queenscliffe .	3-76	14-00	15-79	12-93	Wellington	4-37	10-37	15-28	9-77
Port Elliot . .	3-87	14-95	14-70	11-07	Murray Bridge . . .	4-62	9-76	15-56	8-77
Goolwa	4-47	12-77	18-85	11-46	Mannum	3-17	8-18	11-26	6-69
Meningie	4-52	13-66	18-43	11-64	Morgan	1-72	5-83	6-72	4-89
Kingston	3-75	18-33	24-29	20-97	O'rland Corner . .	1-77	7-27	7-45	5-67
Robe	3-24	18-81	24-22	17-71	Renmark	1-88	6-72	8-43	4-34
Beachport	3-99	20-84	30-48	19-83	Lameroo	4-33	—	13-94	—
Coonalpyn	4-05	12-30	17-77	10-71					

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co. report on September 1st:—

THE WEATHER.—This winter has been one of the wettest on record, and, indeed, right up to time of writing rains have fallen in such quantities that in parts floods have been experienced, and some damage effected. The downpours were so general that spring commences with feed in abundance in all of the agricultural areas, and the present outlook is very assuring to farmers.

BREADSTUFFS.—Flour has not seen any special trading, and with lower wheat values prices declined 10s. per ton. Fodders.—Although growing feed is so plentiful, selling rates in chaff quite held, partly owing to the weather interfering with deliveries of hay, as also the fact that orders from Sydney for top-quality chaff have come this way. Mill offal sold with moderate freedom at prices a halfpenny below closing rates last month. In feeding grains the market for oats was slow, but barley had a fair turnover.

POTATOES AND ONIONS.—Owing to Irish blight troubles in the Tasmanian crops, the tubers there have been shut out from several of the States on the mainland. This gave an impetus to exportations from here of "Gambiers" to Western Australia and New South Wales, but these shipments were just as abruptly stopped, which gave a set-back to the exports of South Australian potatoes. However, it is hoped that stocks of "Gambiers" on hand will all find a market before the new season's crop comes along. Onions.—Dull month's business, the high price somewhat checking consumption, so that sales were of a hand-to-mouth character.

DAIRY PRODUCE.—Following such excellent rains, especially in the northern parts, it only now requires a spell of settled weather conditions to bring along a flow of butter to enable regular weekly shipments of the surplus to be made to the British market. Certainly the supplies of fresh prints offering during August were in excess of the local trade, which was heavy, but the extras were readily disposed of to the neighboring States. These competing factors kept the rooms well cleared, and only a gradual lowering in quotations

was recorded. Purchasers for the old country are now operating, and it is expected that the shipments of butter this season will be substantial. Eggs.—It is questionable whether supplies this flush will be equally as extensive as in former years—this the result of farmers preferring to sell most of their poultry at the high prices offering. However, the inter-State demand for South Australian eggs increases each year, and, fortunately, causes a corresponding improvement in the prices ruling, so that values are now a percentage higher than at the opening of last year's flush. Cheese.—The turnover has kept up remarkably well, and whilst there was certainly a slight easing, this, it is hoped, will be checked with the better inquiry that generally sets in at this period. Bacon-curers have had rather a slack time, whilst, also, selling quotations were not by any means remunerative for factory-cured sides and middles; but towards end of month a better tone in the market prevailed, which had the immediate effect of hardening rates. Honey.—Throughout the season all consignments of prime clear extracted met with brisk clearance, but buyers were not disposed to operate at all freely on anything approaching medium quality lots. Almonds.—Purchasers have eagerly cleared the rooms of all offering, so that stocks are light and values have well held.

CARCASS MEAT.—The auction sales in this line are quite a feature of the Friday markets, when the butchering trade and others buy for their Saturday's requirements. The forwardings in pork were mostly of a good standard of quality, and invariably the dressing was all that could be desired, consequently competition was of a very animated character, and nice prices obtained. Bright, handy shop porkers weighing from 60lbs. to 90lbs. realised the highest figures, whilst prime baconers ranging from 115lbs. to 140lbs. had ready market. Well-fed heavy choppers were also in request, and choice farmers' veal received attention, carcasses with pelt on but minus head, feet, and pluck quitting at top prices.

DRESSED POULTRY.—All lots forward found speedy sale at the Friday auctions, especially where the quality was right.

LIVE POULTRY.—Possibly as an indication of the now better times, poulters have had heavy buying orders at higher rates than usual, and, as a result, bidding at the auctions was extremely lively, and satisfactory rates secured.

MARKET QUOTATIONS ON SEPTEMBER 1ST.

FLOUR.—City brands, £11 5s.; country, £11 per ton, of 2,000lbs.

BRAN.—11d.; **POLLARD.**, 1s 0½d. per bushel of 20lbs.

OATS.—Local Algerian, 1s. 11d.; White Champions, 2s. 6d. per bushel of 40lbs.

BARLEY.—Cape, 2s. 2d. to 2s. 4d. per bushel of 50lbs.

CHAFF.—£3 10s. to £3 12s. 6d. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £5 15s. to £6 per ton of 2,240lbs.

ONIONS.—Gambiers, £8 to £8 10s. per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 10d. to 11½d.; choice separator and fine dairies, 8½d. to 9½d.; medium creamery and poor dairies, 8d. to 8½d.; stores and collectors, 7½d. to 8d. per lb.

CHEESE.—Factory makes, 6½d. to 7d. for new make, matured up to 8d. per lb.

BACON.—Factory cured sides, 8½d. to 9d. per lb.

HAMS.—In calico, 9½d. to 10d. per lb.

EGGS.—Loose, 9d. per dozen.

LARD.—Skins, 7½d.; tins or bulk cases, 6½d. per lb.

HONEY.—Prime clear extracted, 2½d.; secondary quality, 1d. to 1½d. per lb.: Beeswax, 1s. 1d. per lb.

ALMONDS.—Soft shells, Brandis, 6d.; mixed soft shells, 5d.; kernels, 1s. 2d. per lb.

CARCASS MEAT.—Bright shop porkers, 5½d. to 6d. per lb.; medium and good baconers, 5d. to 5½d.; fair to prime veal, 2½d. to 3½d.

DRESSED POULTRY.—Turkeys worth 8d. to 9d. per lb.; fowls 6d. to 7d.

LIVE POULTRY.—Good table roosters, 3s. to 3s. 6d. each; light cockerels, 2s. 3d. to 2s. 9d.; hens, 1s. 8d. to 2s.; ducks, 2s. 9d. to 3s. 3d.; geese, 4s. to 5s.; pigeons, 6d.; turkeys 7d. to 10d. per lb., live weight, for fair to prime table birds.

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* No report received during the month of August.

† Only formal business transacted at the last meeting.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Amyton, June 26.

(Average annual rainfall, 11½ in.)

PRESENT—MESSRS. O'Donoghue (chair), Cormack, Quirke, Ward, Griffin, Crisp, T. and W. Gum, Wallace, Bristow, Stokes, Brown, Baumgurtel, Thomas (Hon. Sec.), and one visitor.

HAND v. MACHINE SHEARING.—Papers were read on this subject by Messrs. Bristow and Wallace. Mr. Bristow's paper was as follows:—"He considered machine-shearing to be better than hand-shearing, and if they could arrange to erect a co-operative shearing shed in the district it would be a great boon. In the first place, labor was becoming more scarce than ever, and good shearers were difficult to obtain. Many men that used to go shearing now had land of their own, or had gone to other States. A holder of a small flock of sheep could not fix any certain date to shear, but had to leave it to the convenience of the shearers, and be satisfied to get them when it suited them to come. If co-operative sheds were erected the same number of men could shear about twice the number of sheep in a given time, and the shed accommodation would be so much better in case of rain. If the shed was of a reasonably large size they could house a thousand or more sheep, so that shearing would not be stopped so long or so often as at present. Then again the floors would be better than those a farmer usually had, and consequently the wool and trimmings would not be damaged as they were in small sheds. In farm sheds that were used as stables there was always straw, chaff, and manure, and even if thoroughly cleaned out some would always blow in from outside, and that would lessen the value of the wool. He lost 1½d. per lb. on all his wool last year for lack of proper facilities for shearing. He had heard people say that sheep were bruised badly by machine-shearing, but he did not think the sheep suffered so much torture as if shorn by blade, as a bad shearer cut little pieces of skin out all over the sheep, and with the machine they were not cut at all. It had been said that wool did not grow so well after being shorn by machine; this he questioned very much, as the machine could not have anything to do with the growth of the wool. Certainly it never looked so long and, indeed, was not so long, having been cut closer, but it grew the same length in 12 months. They found that machine-shearing was being adopted by all the leading pastoralists in this and other States, and discarded by none. These were practical men and knew what they were doing. His opinion was that a great many people were prejudiced against machine-shearing in the same way as they were against all machinery when it first came into use. As to sheep feeling the cold more after machine than blade shearing, he did not think there was any difference. He had had sheep die from cold after being shorn by blade when turned into a paddock where there was no shelter, and had heard of plenty of others dying." Mr. Wallace's paper read as follows:—"He preferred the blades, although he had tried the machine. By the hand-shears sheep could be shorn and the wool on trucks for about 28s. per 100, whereas by the machine method the cost was about £2. If shearing with the machine were followed by a cold wet night there was a big risk, unless there was some shelter, but with the blade there was less danger. With the blade there was no wear and tear or breakages similar to those that had to be attended to with the machines, and if the engine broke down with the latter the whole shed was idle. Against the machine also was the extra expense of oil for the engine and a man to attend to it and the machines. Hand-shorn sheep commanded a better price in the market, and finally he preferred the blades as they did not drag the wool out by the roots. If the combs were badly kept the wool was pulled out by the roots or scorched by the friction of the machine. In one shed near by 500 sheep were lost last shearing in one wet night, and it took all the yard hands and two teams of horses to remove the dead sheep the next day. In hot weather machine-shorn fat sheep compared very unfavorably where there was no shade as against the blade-shorn sheep." Members all favored co-operative shearing, but thought where flocks were small hand-shearing was preferable. It was pointed out by some members that the machines must be working satisfactorily or they would have been discarded before now.

MARKETING WHEAT.—It was resolved that, in view of the present unsatisfactory mode of marketing wheat, the Government should be requested to erect weighbridges at all railway stations in the wheat-growing districts, so that wagon loads of wheat might be weighed in bulk.

CARRIAGE OF STUD STOCK.—It was also resolved that, in view of the importance of stock-raising to this State, stud stock should be carried at a reduced rate, and not, as at present, charged double rate by the Railway Department.

Arden Vale and Wyacca, August 2.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Eckert (chair), Williss, Hantschke, Pradel, Rodgers, Hawes, J. and P. Greer, O. and P. Hannemann, F. and H. Schuman, C. Pearce, jun., C. F. Pearce (Hon. Sec.), and several visitors.

CO-OPERATION.—The Hon. Secretary initiated discussion on the question of co-operation. He considered that if more attention were paid to co-operative effort among producers they would not hear so much about socialism; because producers were quite capable of marketing their produce themselves, as was done in New Zealand and in this State through the S.A. Farmers' Co-operative Union. Until recently farmers were greatly prejudiced against their own Union, on account of the wheat prices being kept level with those of the so-called "honorable understanding." This Branch's members and other intelligent farmers were commencing to see plainly that nothing was pushing their Union along better than the combination among wheatbuyers. The Union at present was doing about one-eighth of the wheat business, and in the near future would pretty well do the major portion, with the loyal co-operation of shareholders. The members were also very pleased that a permanent agency was now established at Quorn, and that stores were to be erected at once to supply the long-felt wants of shareholders and farmers. Now that the Union was importing some of the things required by farmers in exchange for wheat exported by them, they were in a position to do business to the very best advantage.

LAND SETTLEMENT.—The Hon. Secretary read the following notes on this question:—"A short time ago Mr. McColl, of the Quorn Branch, a most experienced farmer, stated that it would be a good thing if more of the best lands were utilised and let out on the share system, as was done in a good many parts of New South Wales, and in a less extent in our own State. He could speak from experience in regard to the share system, and the strongest point in its favor was that any young man with push and energy could get a good start in life this way which could never be obtained otherwise. On some good mallee country, where landholders were providing land, stock, and implements for half the crop, it was a wonderful inducement to anyone. The weak point about the share system generally was that there was no inducement for permanent settlement and beautifying the home; and he also considered that for the owner who supplied land, stock, and implements to take half the crop was excessive. The question as to what they were to do for land for their sons who were growing up to manhood in hundreds had to be met. The position was not nearly so hopeless as it appeared to be. They were informed that 2,000,000 acres of mallee land, mostly arable, on the West Coast could be utilised for settlement purposes. It was a great mistake to grant very large holdings of good arable mallee lands to farmers; 2,000 acres was enough for any one settler, and that area would take a long time to get the mallee roots cleared out. Until that was done the land could never be utilised to the best advantage for grazing purposes. Another great drawback with the western country was the trouble and expense attached to procuring a good supply of water for domestic and stock purposes. He knew several farmers who had got rid of good holdings there through not being able to overcome this difficulty. In mallee districts not far from the River Murray there were 750,000 acres suitable for settlement, provided a railway was constructed to get the produce to market. Good water was obtainable in the country described at a very moderate cost by boring, and its comparative nearness to the larger centres of population went a long way towards securing a ready market for all produce. In regard to settlement on the irrigation blocks on the River Murray, there were thousands of acres of swamp lands waiting to be reclaimed, and when prepared for settlement it only required about 40 acres to keep a large family in comfort. The land was of such high quality that it would readily realise £30 per acre if offered in the open market. They were informed that there was abundant land along the River Murray to carry a population of half a million people if the water was utilised to the best advantage. The provision made to advance loans at a moderate rate of interest to settlers directly they secured a block of land, to assist them when help was most needed, was a step in the right direction.

Carrington, August 12.

(Average annual rainfall, 11½ in.)

PRESENT—Messrs. W. J. Gleeson (chair), C. and J. Fisher, Cogan, Kaerger, Williams, Vater, Ormiston, Fuller, Beerworth, and Bock (Hon. Sec.).

SHEEP ON THE FARM.—Mr. Fisher introduced this subject for discussion. He claimed that in this district it was almost necessary for every farm to have a few sheep, as the land was over run with wild oats, and these could not be kept down by cultivation. Sheep fed very close to the ground and were better able to destroy oats than any other animal. Where a good percentage of lambs was obtained they paid well, while the wool brought in revenue, and the supply of mutton for use on the farm saved a considerable sum in the course of a year. Mr. Ormiston said the greatest drawback to sheep in the district was the wild dog pest, and foxes were increasing very quickly, so that losses were sometimes very heavy. For clearing land of wild oats it was necessary to fence the land into small paddocks separate from the grass lands, as if the sheep had a chance they would leave the weedy land, and for preference eat the grass land bare. It was better in this district to have dry sheep than breeding ewes, as it was necessary to yard them on account of the wild dogs, and yarding them meant death to a large percentage of the lambs. Mr. Williams indorsed this last statement in regard to dry sheep and breeding ewes, and said he intended to keep only the former in future. The Chairman also held this view, and repeated the necessity for fencing into small paddocks. He claimed that for the farmer who had his family to help him, dairying was a payable industry in this district.

Cradock, July 31.

(Average annual rainfall, 10½ in.)

PRESENT—Messrs. J. Lindo (chair), McAuley, Paterson, Marshall, Finch, Fitzgerald, H. Lindo, Richards (Hon. Sec.), and two visitors.

AGRICULTURAL EXPERTS.—It was decided to place on record the regret felt by members of this Branch at the resignation of the wool expert, Mr. W. J. Mathews. Members thought it a pity that sufficient inducement was not offered to retain the services of this and other experts who have been allowed to leave the State.

RAIL CARRIAGE.—Attention was called to the high rate of freight charged upon material such as poisons, traps, &c., for destroying vermin.

Johnsbury, August 21.

(Average annual rainfall, 9½ in.)

PRESENT—Messrs. Read (chair), Dunn, King, Hollet, Brook, and Chalmers (Hon. Sec.).

EXTERMINATION OF FOXES.—Mr. Brook referred to a paper on this subject, printed in August issue of *Journal* (page 59). He recommended the following method of killing this pest:—The carcass of a sheep was partly burned and dragged over the ground behind a dray, while a man walking behind laid poisoned liver baits. He had killed as many as 30 foxes at one time in this manner. The Branch was not in favor of district councils having anything to do with payment for scalps, nor did it favor a compulsory tax for destruction of foxes, as these animals were always on the move.

Morchart, August 3.

(Average annual rainfall, 11½ in.)

PRESENT—Messrs. Scriven (chair), Kirkland, McCallum, W. and H. Toop, Loftes, J. Scriven, Okley, Kitto, Rupke, Reichstein, Peak, McDougall (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Messrs. J. McDougall & Sons.

CLEANING OF WHEAT.—Mr. Loftes read a paper on wheat-cleaning. He contended that sufficient care was not taken by the average farmer in the cleaning of wheat for market purposes. So long as he made a f.a.q. sample he was quite satisfied, and probably maintained that it did not pay to clean wheat beyond that standard. Under the present system he was to a certain extent right, because the buyer had a fixed top price for all f.a.q. samples, and although a certain farmer might offer wheat of a very high quality, weighing

say 66lbs. or 67lbs. to the bushel, he could not under the present system get any more than the f.a.q. price. Farmers had therefore been known to mix wheat of a very poor sample, say under 60lbs. to the bushel, which they could not get market price for, with the high quality wheat above mentioned in order to make it saleable; and so, instead of being paid the true value of the two wheats, they only received the price for f.a.q. samples. This, he contended, was a serious loss, and had a marked effect, inasmuch as it actually kept wheat down to f.a.q. level. It was therefore not in demand by foreign buyers as anything better than an average sample, whereas if the wheat were properly cleaned up to its highest possible standard it would probably command top price all over the world in the course of a few years, and would be first in demand by foreign buyers. Such a state of affairs would certainly mean an extra 2d. or 3d. per bushel to the grower. At present South Australia only sent away an average quality of wheat. The grain itself might be good, but was not properly cleaned to make it up into the best sample. The man who bought it had to allow for the amount of rubbish in it, and so deducted, or in other words, fixed his price accordingly. This being so, it would pay in the long run to clean wheat to its highest standard. Then again farmers were paying rail carriage and freight on material that ought to be kept at home and made use of profitably for horses, pigs, or fowls, as in many cases sufficient feed to get the best results from these was not kept. In taking wheat to the miller for gristing they were docked 3lbs. per bushel, and this they certainly lost, but would not have done so had they cleaned the wheat thoroughly.

Orroroo, August 16.

(Average annual rainfall, 13 $\frac{1}{2}$ in.)

PRESENT—Messrs. Dunn (chair), Roberts, Robertson, Copley, and Tapscott (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that only five meetings had been held, and he regretted to state that no papers had been read at these meetings. The average attendance had been nearly six members. Mention was made of various incidents worthy of note, and in conclusion the Hon. Secretary asked members to give more loyal support to the Bureau, drawing attention to the benefit and instruction all had received in the past through its instrumentality.

Quorn, July 31.

(Average annual rainfall, 13in.)

PRESENT—Messrs. Thompson (chair), Noll, Cook, Finley, Schulze, Brewster, Mattner, Patten (Hon. Sec.), and one visitor.

MONGREL BULLS.—Mr. Cook thought some steps should be taken to prevent mongrel bulls from being hired out, and that pure-bred bulls should be licensed. The Hon. Secretary pointed out the annoyance caused by mongrel bulls roaming about the roads when farmers were trying to improve their stock by going to the expense of keeping first-class animals. Mr. Noll thought there were as good cows in this district as those to be found around Adelaide. Mr. Brewster considered it would be an improvement if a good bull were procured for the district that farmers could have on their farms in turn.

SILo PITs.—The Chairman had been given to understand that the Government was prepared to assist farmers to erect silo pits. Someone should try the experiment, as a silo could be erected cheaply with old sleepers on end with a band round them. Mr. Noll thought corrugated iron would be as good and as cheap as sleepers.

UNSOuND STALLIONS.—This Branch was strongly of opinion that stallions used as sires should be licensed, so that the stamp of horses in the State would be improved.

RABBITS.—Mr. Schulze found spring traps set by the burrows very effective.

Wepowie, July 29.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Halliday (chair), T. and A. J. Gale, Knauerhausc, Fuller, Rielly, Roberts, Pearce, J. and T. F. Orrock (Hon. Sec.), and one visitor.

WHEAT-GROWING.—Mr. Pearce read a short paper, in which he advocated early fallowing for this district. He would plough to a depth of about 3 $\frac{1}{2}$ in. and then use the cultivator and root up the ground deeply, leaving it very rough. If the soil is always worked shallow it became very hard and difficult to get the seed in. He would put in 1bush. of seed and

40lbs. of super. on fallow land, and for later sowing 10lbs. more super. but the same quantity of seed. He drilled from 1½in. to 2in. deep and harrowed after the drill. For very late sowing he put on about 80lbs. of super. and a peck more wheat. Mr. Rielly thought that 3½in. was not deep enough to fallow, and most members agreed that 4½in. was quite shallow enough. If the land was of a hard nature deep ploughing was best. Mr. Roberts thought 80lbs. of super. per acre should be used in this district, while Mr. T. Gale pointed out that the quantity must be governed by the soil, and some parts needed more than others. Mr. A. J. Gale liked to have as much early fallow as possible. He did not favor cultivating fallow if the sheep could keep the weeds down. Mr. Knauerhause advised 1½bush. of seed to ensure a thick crop. Other members thought this excessive for the district; they would not sow more than 1bush. per acre.

Wilmington, August 26.

(Average annual rainfall, 17½in.)

PRESENT.—Messrs. Slee (chair), Hannagan, Jacobs, Stephens, George, Noll, McGhee, Crawford, J., G., and W. Schuppan, Hoskins, Heard, Robertson, Zimmerman, Scholefield, Payne, Jericho (Hon. Sec.), and one visitor.

THE WHEAT PLANT.—Mr. Jericho read a paper giving some interesting facts in regard to wheat, the principal points being as follows:—“It might be interesting to hear something about the origin, variations, effects of environment, &c., of wheat. The geographical origin of wheat had never been determined. It had been found growing wild in the valleys between Arabia and Persia, and scientists believed that from there it had spread to the rest of the world. The historical origin was also unknown, though, according to the oldest records, it was grown in China 5,000 years ago, and was one of the chief crops in Egypt and Palestine. In the scriptures wheat was first mentioned in the time of Jacob, but there was nothing definitely said as to how it was grown. The fact that in the exhumation of ancient cities explorers had discovered samples of wheat went to show that wheat was one of the main cereals used by the white races in the early days. It was supplanted by rice, mainly when colored displaced white people in India, Arabia, Egypt, and other places. In 1860 wheat was grown as far north of Chicago as 200 miles, and only 40 years later it was found growing 1,000 miles from the same place. Wheat would grow under extreme conditions of both heat and cold, and was grown 10,000ft. above sea-level and 200ft. below. It was little wonder that wheat was gradually displacing every other kind of cereal, both with white and colored people. The great food value of wheat, ease of cultivation and preparation for use, its adaptation to different climates and soils, and the quick returns received were all factors that enhanced the value of wheat. At the present time fully 40 per cent. of the world's population derived its sustenance mainly from wheat, and the world's annual average production and consumption was about 3,000,000,000bush. Wheat was easily influenced by environment, the shape of grain and its color being affected by the locality in which it was grown; and as it was shipped for seed purposes as well as for food, it was no wonder that there were many hundred distinctive varieties of wheat. The best quality wheat for bread-making was grown in the western parts of America, in Russia, and the southern parts of Argentina. Hard wheats had better gluten contents than soft. This was the most desirable part of the nourishment found in wheat, but tended to give a yellowish color to bread, against which fashion rebelled. Innumerable experimental farms had been established all over the world which were doing good useful work. Mainly through them the entire wheat yield of the world was being improved.”

Wirrabara, August 7.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. Lawson (chair), Lomman, H., A., and G. Woodlands, Curnow, W. H., W., and E. Stevens, J., C., and E. Hollett, Pitman, Kendrick, Blessing, and H. Lawson (Hon. Sec.).

FRUIT EXPORT TRADE.—Mr. Lomman read a paper on this subject, to the following effect:—“The production of all kinds of fruit had made rapid strides during the last few years, with the result that production had more than reached local requirements. It must be recognised that they had a climate and soil which, with proper cultivation, could not be beaten even by Tasmania for color and quality of apples. This had been fully demonstrated time after time, the apples sent from this State bringing a higher

price than those sent from Tasmania. While production had made rapid strides, a great many producers were not yet fully alive to the importance of the export trade. Not only was it necessary to be well versed in the cultivation of fruit, but after that had been done there was another important problem staring the producer in the face, and that was how to dispose of his produce at a price that would pay him. The only solution to this difficulty lay in seeking for markets outside this State. The first question that presented itself to the orchardist was as to the best kinds of apples, pears, and oranges to export to other countries. He would suggest for apples, Jonathan—placed first because of its earliness, it being a week or two before Cleopatra—which brought equally good prices where it could be grown free from black spot. Generally speaking those two kinds were above all others, although Dunn's Seedling was a good third where it did well and grew to perfection. He would emphasize the great point in the export of apples, viz., not to attempt to ship too many kinds of inferior quality, as that only tends to ruin prices by placing a lot of practically unsafeable sorts on the market. Another question was the size or grade which was best to export. He found the best grade of apples to pack for export was about 2½ in. to 3 in. This grade seemed to suit better than any other, and brought the best prices. A grade of larger size would sell at times and bring good returns, but overgrown and disfigured fruit with blemishes was not readily saleable. Overgrown apples were not good for export even if clean, being too soft and subject to discoloration on the outside. Great care and skill was necessary in grading and packing, for the result depended largely on the way the fruit was handled after being picked. A uniform grade was a most important matter, and required the whole attention of the one who was grading to get each apple as nearly as possible in size. Anyone who was used to the work could soon see the differences in size and place each grade in separate piles ready to be wrapped in tissue paper before being packed in cases. The handling required to be done carefully, or the fruit would be bruised. Each apple should be placed in the case and kept in its right position, the whole case being packed in layers until it was full. Enough wood wool should be placed on the top to need a little gentle persuasion to get the lid on. Another important point for producers was that it paid them to ship their own fruit, and not to sell to fruit speculators, and to ship through a good reliable firm that had good, up-to-date agents at the other side. The prices realised depended largely on the energy and ability of the man on the other side. The large quantity of pears that had been shipped during the last two or three years spoke for itself as regards the prices realised, and had become a good thing for all growers of this fruit; but pears had not been exported largely from this district, the same attention not having been paid to pear export that had been given to the export of apples. Yet it was a matter that was worthy of the best attention of orchardists. The few that had been shipped from this district brought good returns, some up to 14s. per case net for about 30lbs. of fruit packed in trays. This seemed to be the best method of packing. The Washington Navel orange was without doubt the orange for the export trade. None had been exported from this district, but a consignment was sent from Mildura and brought top prices in London."

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Appila-Yarrowie, July 9.

(Average annual rainfall, 14½ in.)

PRESENT.—Messrs. Wilsdon (chair), Reichstein, Francois, Keller, Klemm, Bottrell, Catford, Daly, Becker, Jericho, Mayor (Hon. Sec.), and five visitors.

IRRIGATION.—Mr. Becker read a paper on irrigation, in which he spoke of the benefits to be derived from even a small area of suitable land near a water supply; and there were few farms in the district where irrigation could not be carried out to some extent. Lucerne, sorghum, maize, and other fodder plants suitable for green feed could be raised at little expense, and would repay handsomely any little trouble and expense in the preparation of the land for the crops. He suggested as suitable a fairly level piece of land near the water supply (whether a stream or got by sinking), with a fairly loose soil about 6 in. or 8 in. deep, and a clay subsoil. The land should not have a greater fall than about 1 in

500, so as to allow the water to flow slowly and soak in well. If the land fell away too much the water flowed over it too quickly. He found that the best way to prepare the ground was to plough it well and work it as level as possible and then plough a crown every 10ft. to 30ft., according to the supply of water and the fall of the land. It was better not to have the lands too wide. Another way was to plough the ground two or three months before in lands with a good crown, work it well, and then, when it was to be sown, to plough it back, leaving the crown of the first ploughing about 9in. wide, to keep the water in its boundary. If the crops were to be grazed or fed off the paddock should be very small—the smaller the better—so that each paddock could have a spell between the waterings; but it was better to cut the crops and feed it to the stock. Lucerne should be cut and allowed to lie for about half a day before feeding it, especially to milch cows. He considered, after experimenting with lucerne, sorghum, maize, and beetroot, that lucerne was by far the best fodder crop to grow in the district. It responded well to irrigation, grew quickly, and would last for years with the one sowing. It was superior as a fodder to the other crops which required resowing annually. He found the other named crops difficult to grow, and that they were more affected by the weather than the lucerne.

LAMPAS.—Mr. Bottrall initiated a discussion as to the best methods of treating lampas in horses—burning or bleeding. After considerable debate, in which most of those present gave their experiences with horses both young and old suffering from the complaint, it was decided that too much notice was taken of it, and that if left alone the swelling of the gums in most cases subsided in time. Both treatments were considered cruel in the extreme, and it was pointed out that by burning very often the mouth of the animal was permanently injured. If an owner considered something should be done, bleeding or lancing was recommended as the most humane treatment and likely to do less harm, even if it did little good, than the use of the red-hot iron.

Belalie North, June 30.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. C. Waldhutter (chair), O'Leary, Tremlett, Arndt, Atkins, Smart, Warner, J. Waldhutter, Bladon (Hon. Sec.), and eight visitors.

PIG KILLING AND CLEANING.—Mr. O'Leary initiated discussion on this subject. He advised shooting the pig with a small-bore rifle prior to sticking with a knife, as this prevented a lot of unnecessary tumbling about in the slush. He strongly advocated the use of a vat for scalding purposes. It was essential to have the pig well covered with the first water, as otherwise the pig would be only half cleaned.

FARM ECONOMY.—Mr. Smart read a paper on economy on the farm. The farm should be well provided with sheds, barns, &c. An entry should be made in a book kept for the purpose of the daily income and expenditure. It was not economy to put a machine in the shed before overhauling and attending to the parts which needed replacing so as to be ready for the coming harvest. The old proverb which said, "A stitch in time saves nine" could be applied nowhere better than on the farm, especially in regard to machinery. Horses could not be too well cared for; they should have good comfortable stables, with mangers which would cause as little waste as possible. The stocking of the farm was a great factor in its success. It was not economy to have a farm overstocked. It was always better to have a little surplus feed than to be a little short of it. Every farmer should have a few sheep on the farm for household purposes and to keep the weeds down. There was a good deal to be gained by covering haystacks well with straw; this would prevent so much damage and waste when it was to be removed. A good straw stack should be provided for those animals that were not in the shed during the winter. A lengthy discussion took place, in which the members agreed with the views expressed in the paper.

Beetaloo Valley, August 2.

PRESENT—Messrs. Ryan (chair), Woolford, A. and F. Bartrum, Curton, Murphy (Hon. Sec.), and two visitors.

PLoughshares.—The merits of various kinds of ploughshares were discussed. The majority of members were in favor of steel on malleable shares where the land was rough. It was found that when worn they could be replated several times, and the plates could be drawn out thinner when required for hard ground.

WATERMELONS.—Mr. Ryan recommended Cuban Queen and Albert Honey varieties as specially suited to the local soil. Watermelons were often grown in this district weighing 40lbs. and of good flavor.

MANURE FOR WHEAT.—Members were in favor of putting on about lewt. of super. to the acre. It was pointed out that although the crop might not look better than where 60lbs. or 70lbs. had been applied, it was found that the heads were better filled, the grain plumper, and the land grew a better crop of grass the following year. Sixty pounds to 80lbs. of seed per acre was considered sufficient for this district.

CROSS-DRILLING.—Members were all in favor of cross-drilling for hay; and Algerian oats, cross-drilled with Yandilla King, Marshall's No. 3, or Federation were recommended.

WEATHER REPORT.—Several members reported that their crops were suffering from excessive moisture. Yandilla King and Marshall's No. 3 were considered to be the varieties least affected.

SYSTEMATIC FARMING.—It was considered that farmers in this district were adopting a more systematic method of farming.

Caltowie, August 9.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. N. Hewett (chair), J. and J. G. Lehmann, Petatz, Patter, Graham, E. Hewett, Neate, and F. Lehmann (Hon. Sec.).

HAY WHEATS FOR THE DISTRICT.—Mr. L. Batten read a paper to the following effect:—"He considered that for hay the wheats most suitable to grow in this district, both for the farmer and the merchant, were Marshall's No. 3 and Marshall's Select, for these reasons: its remarkable weight, its good color, its resistance against rust, enabling it to have good grain at all times, even when the stalk at the bottom was still green. It stooled well, and on account of the quantity of the flag the binder had a chance to make a sheaf that would be found to hold together well. This was a point in its favor owing to the amount of handling it was subject to in the process of chaffing. Another point was that the stalk was of that quality which contained a good deal of moisture, and therefore did not break up and splinter when being chaffed with a cutter driven at the high speed used in mills to-day. There were other wheats suitable for hay. Federation up to date had been very little cut in the district, though in the *Journal* it was spoken of in most cases where wheats for hay were mentioned. Yandilla King was also considered by many farmers to be good for hay, but like Federation it had not been cut to any extent in this district. In the *Journal* for July, 1909, a farmer stated that he had been growing King's Early for hay for his own horses for a considerable length of time. Notwithstanding the fact of the variety having long and strong beards, he said that at no time had he noticed sore mouths among the horses after it being served to them both as long hay and as chaff. From the merchants' point of view it was a poor hay for chaffing, owing to the large amount of dust produced. Nevertheless it had one advantage in its forward growth and early appearance. The merchant was able to offer a fair price and perhaps receive more by getting it on the market quickly. Another wheat spoken of as being good for hay in some districts was Majestic, and no doubt it was so; but it would have to be sown for hay alone, and not for the purpose of hay or wheat, according to the nature of the season. In this particular district it had proved a poor yielder. One thing in its favor was that providing the merchant could obtain a quantity of Majestic, he could give up to 5s. per ton above what other hay was selling at, on account of its splendid color and weight. It was difficult for the majority of farmers to say at seeding time what variety or which particular paddock they intended to cut for hay. A good crop for feed was a mixture of wheat and Algerian oats. The wheat sown should be an early variety, and should be drilled in with manure. The same plot should then be cross drilled with the oats, also with manure. By sowing each kind separately the trouble of uneven crops was done away with. The wheat must be cut when the oats were beginning to turn, or lose the green color at the bottom of the stalk. The seed would then be found to be fairly solid, while on the other hand the wheat would still be green right from the bottom of the stalk. This mixture for horse feed could not be beaten in his opinion. During last season a farmer sold him a few loads of this mixture, and with all the handling it received the oats were not displaced. It was also noticed that owing to the oats being shorter than the wheat they were sheltered to a great extent." In the discussion which followed Mr. Lehmann considered Ranjit wheat the finest type of hay wheat. Federation made nice chaff and was eaten readily by horses as long hay, but members pointed out that it was not a heavy hay yielder.

TAKEALL.—Mr. Batten quoted an instance of a farmer near Georgetown who had cut a crop affected with takeall for hay, and had then sown oats with 40lbs. super. per acre. He had early feed for his stock, removed stock at the right time, and reaped four to five bags of oats per acre. A succeeding wheat crop was quite free from the disease.

Mount Bryan, August 9.

(Average annual rainfall, 15½in.)

PRESENT—Messrs. Hatherley (chair), Dunstan, Wardle, H. and E. Collins, Hoffman, Beckwith, Connors, Kelly, Caldicott, Schmidt, Trallagan, Thomas, Nutt, Gregurke, and A. Collins (Hon. Sec.).

TREE-PLANTING.—Mr. W. R. Dunstan read a paper on this subject. “For planting trees from bamboos or pots the ground should be ploughed to a depth of 6in. to 8in. to prevent the weeds from growing around the young trees, or to simplify any clearing of grass and weed that might become necessary later. The hole for the tree could be dug, say 3ft. square, and from 1ft. to 18in. deep, but care should be taken so that the subsoil or clay would not be mixed with the top soil, and then the hole should be left open to the sun and air for a week or two. The bottom of the hole should then be well loosened, but not necessarily taken out. When ready to plant it was best to fill in with the top soil mixed with good rotten dung or scrapings from around the woodheap, so that the soil would not bake hard. To plant a tree that was in a bamboo it was best to split the latter in two with a sharp knife and place the bamboo containing the young tree in the ground to the right depth. The soil must be well packed down and round the plant. If the trees were in pots, which was much better than the bamboo, the soil from the pot should not be removed from the tree, but all placed in the ground just as it came out of the pot. This could be done by placing the left hand on the top of the pot with the plant between two fingers and turning the pot upside down. If the earth was likely to crumble, that difficulty could be overcome by moistening it a little some time before planting out. The plant should not be put in too deeply, and the soil immediately around the tree should be high enough to prevent the water from settling round the tree itself, or it might be drowned. The best way was to make a small channel round the tree about a foot away. Young trees must be sheltered from wind and frost, or they would not survive the change from the nursery to the open, and this could be done by means of an old bag with the bottom cut open placed round the tree over four stakes. It should be an inch above the ground, to allow a free passage of air. The higher the wind guard was put the more the tree would grow upwards for the sunlight. It was also a good plan to plant trees leaning a little to the west, so that the prevailing winds would tend to straighten them rather than otherwise, and also because the morning sun was said to tend to draw the tree in the direction of the east. For fruit trees the land should be ploughed from 9in. to 1ft. deep, or, better still, be trenched, and a good coat of stable manure should be worked in. The trees should be placed in rows at least 25ft. apart, with the same distance between the trees. The holes for planting should be of a good size and carefully prepared, and the trees should not be deeper in the ground than they were in the nursery. The long root should be placed towards the west or wherever most wind came from, and the soil well trodden down. If the branches on top of the tree were very long he would advise pruning a little, provided the sap was not up. The remarks in regard to the protection of young trees from the wind and planting them leaning towards the west applied just as much to fruit trees, and both they and ornamental trees did better if a mulch of cocky chaff or straw were spread over the roots in summer, and most trees needed some watering during that period, especially if it were a long one.”

Redhill, August 21.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. Lithgow (chair), Treloar, Steele, Wheaton, Stone, Smith, Trewin, Cleve, Pilkington, Vivian, Dunsford (Hon. Sec.), and three visitors.

VETERINARY SURGEON FOR THE NORTH.—The Hon. Secretary read a paper dealing with this question. He believed the time had come for definite action in this matter, but considered that some agreement as to method should be arrived at among the farmers. He suggested that a man should be advertised for, and that special attention should be given to proper qualification. This man should reside at a central railway town, cover a radius of 50 miles in his veterinary work, and should be paid at the rate of £1 a day by

the Government. The local residents should guarantee half this amount. Fees for services would be charged and recovered in the ordinary way. The amount spent in this way would be very small compared with the loss at present sustained by the death of valuable stock. A general discussion followed, in which members differed somewhat in their views as to the area which one man could properly attend to, and the salary which he should receive; but they expressed themselves very willing to provide a share of the subsidy proposed if some arrangement could be made.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, July 31.

(Average annual rainfall, 21½in.)

PRESENT—Messrs. Ball (chair), Salter, Smith, Player, Stevens, Collins, Friend, Thorn, Sibley, Plush, Wishart, Swann, Matthews (Hon. Sec.), and one visitor.

ANNUAL REPORT.—The Hon. Secretary's report showed that 13 meetings had been held, with an average attendance of 10 out of 15 members. The rules in regard to apology for non-attendance had been strictly enforced with satisfactory results. Two homestead meetings had been held, also two joint meetings with Lyndoch Branch. The Branch again arranged for a comprehensive exhibit of the products of the district in connection with the Angaston Show. Papers had been read on the following subjects:—"Spur-pruning," "Use and Abuse of Firearms," "Pumps and Taps," "Cooling and Ventilation of Houses," "Export of Fruit," "Local Shows and Competition," "Cultivation of grasses," "Cool Chambers," "Manuring of Orchards and Vineyards." This meeting was held at the homestead of Mr. R. Player, members being entertained at tea by Mr. and Mrs. Player. The Chairman, on behalf of the members, presented Mr. F. S. Matthews with a pair of gold sleeve-links in recognition of his work during the past fourteen years. Members referred in appreciative terms to the energy and enthusiasm displayed by the Hon. Secretary. Mr. C. J. Stevens was elected Chairman and Mr. Matthews re-elected Hon. Secretary. After formal business was concluded a social evening was indulged in.

Clare, July 30.

(Average annual rainfall, 24in.)

PRESENT—Messrs. Kollosche (chair), Nolan, Bowman, Lockyer, Victorsen, Berridge, Radford, Pryor, Walker, Miller, and Knappstein (Hon. Sec.).

ORCHARD NOTES.—Mr. Nolan read a paper as follows:—"The question had often been asked, 'What chance of success had a man who, with small capital or none, undertook the planting of a garden?' What was the cost of bringing a garden into fruition? This was an interesting question, and one not easy to answer. He would refer only to vines, and would touch first on planting—a matter to which he would not refer but for the needlessly elaborate and laborious methods advocated at various times in the press. A most simple and expeditious way was to plough out double furrows of a fair depth, say 6in. or 7in., along the line of the future trellis; then stretch a wire across the furrows at right angles, and plant at the points of intersection with the furrows. Two good men in average soil would plant two acres a day by this method. As regards cultivation, hand-hoeing was very beneficial. General cultivation was undoubtedly very desirable, as the frequent stirring of the soil mellowed and promoted its fertility, killing the weeds as well. But the root system of the young plants did not, especially in the first year, extend far, and hand-hoeing was of the most marked benefit. Locally, young vines were hoed five times the first season, in fact after every fall of rain, and the resulting benefit was correspondingly great. He would strongly emphasize this. Coming now to the trellising. This depended so largely on the height and number of wires, upon soil quality, location, altitude, and other circumstances, not forgetting personal idiosyncrasy, that one must depend largely on one's own judgment. One thing, however, was most desirable—to trellis as early as possible, as the vine, being a natural climber, certainly grew better when on the wire. He

was rather in favor of a low than of a high trellis. He would say nothing as to pruning, as experience, based upon the circumstances peculiar to each case, must principally be depended on here. In regard to the sultana there was one thing to be said, however; this vine, for next season's crop, depended mainly upon this year's rod growth, and the stronger these rods were the better the prospect for the future crop. There were generally some useless shoots bearing no fruit, and, from their position, unsuitable for next year's fruit rods. By disbudding these the flow of sap, being diverted into the remaining rods, would make them so much stronger. It really was a form of summer pruning, but of course judgment must be exercised, else more harm than good might result. Other points, such as drying, cleaning, co-operation amongst growers as regards grading and marketing of fruit, and so on, were beyond the scope of these notes. As to cost. Sixteen acres were planted six years ago, and the total cash outlay thereon up to the time of bearing was not quite £30. He must explain that this included nothing for labor, nor for posts, which were got for the labor of cutting them, nor for stock and implements, which were on hand. However, posts were to be had reasonably, and the man with limited means could, for the first few years, dispense with expensive stock and implements. Of the above area about six acres were on poor soil, and not yet in bearing. From the balance, it might interest members to know that the gross value of the produce to date was in excess of £500." A good discussion followed, in which Mr. Jarman and several members were in favor of a high trellis for currants.

Gawler River, July 30.

(Average annual rainfall, 18in.)

PRESENT—Messrs. Roediger (chair), Spencer, Hayman, Hillier, A. M. and J. H. Dawkins, and Winckel (Hon. Sec.).

SHELTER FOR STOCK.—Mr. Hayman introduced this subject, and emphasized the advantage of natural shelter from clumps of trees, hedges, &c. He did not like boxthorn, and pepper trees suffered from the wind and became weather-beaten. Sugargums did not provide sufficient shelter and were great robbers of feed. Redgum did not rob the grass to the same extent. Trees should be planted in rows to break the prevailing winds. If stock had shelter they required less feed and did better, and it was only humane to provide it. Members did not agree with Mr. Hayman in regard to the pepper tree, but thought in some cases it made a good shelter. Mr. Winckel pointed out that the kind of trees to plant for shelter depended on the locality. In sand nothing was better than native pines. Members recommended Aleppo pines and peppermint for swampy and blue clay land, and also pointed out the advantage of having big stacks of straw in the paddocks. It was also mentioned that hedges were harbors for sparrows, and the advantage of pollarding trees so that they should grow wood and shelter, pointed out. It was considered advisable to have shelter near the water for the benefit of the stock.

Mallala, August 2.

(Average annual rainfall, 16 $\frac{1}{2}$ in.)

PRESENT—Messrs. Marshman (chair), Nairn, Moody, G. Marshman, Worden, Murphy, Nevin (Hon. Sec.), and two visitors.

UTILISATION OF STUBBLE.—Mr. Worden addressed the members upon "The Utilisation of the Stubble." He contended that if some suitable method could be discovered of working the stubble effectively into the soil, the enrichment of the land would be absolutely certain, and in marked contrast to the frequent loss now sustained by the dissipation of the ashes by the wind when burnt. A heavy crop—which if cut for hay would give a yield of 3 to 4 tons—if in the form of stubble, and worked well into the land, must be of immense benefit. Under the ideal system of cropping every three years upon a farm of sufficient area, he considered this system could be adopted. Upon an area of 500 or 600 acres, where the land was cropped every other year, he doubted if means could be devised to utilise the stubble. He had heard it reported that the ploughing in of stubble had produced an abundance of grubs. He did not know how far this was true, but he was inclined to the view that the grazing capacity of the land would be reduced. The good impressions left by old chaff heaps was an important ground for concluding that the system would be beneficial. He only saw one way at present to accomplish the work, and that was by the use of the disc plough. If the stubble were broken in the same direction as the harvester was used, and then crossed by the disc plough in dry weather, satisfactory

results might be secured. In this way a nice lot of ploughing would be prepared for the early rains, a big start for fallowing would be had, and the horses could be turned out early to graze instead of feeding from the stack yard. If the season should be wet, the land, after having been ploughed, might be difficult to work, and would thus need a disc-harrow and probably a disc-drill. The price of the plough would be £31 10s.; harrows, £15 5s. and the usual hoe-drill could be converted into a disc-drill for £7. In the criticisms which followed, Mr. Nairn agreed that there was a waste through burning the stubble—nitrogen in particular, being lost. The difficulty would be to make the crop grow when the stubble was mixed into the soil. It might grow a rank crop in the early part, but when the dry weather came it would be a partial failure. Land had been known to produce good crops for long periods with the stubble burnt. If crops were required to be obtained every second year—a method which he considered the better to secure quick monetary returns—the stubble must be burnt. Mr. H. B. Moody said the subject was a wide and important one. The burning of the stubble was a great loss. Later on it might occur that such a loss would be detrimental to the interests of the farmer. While by burning the straw a certain amount of plant food was added to the soil in the ash, if the stubble was ploughed in fermentation caused gases which were beneficial to the soil and insoluble elements were thus rendered soluble. If phosphates were added continually they might be able to continue the practice of burning, but why buy phosphates if they could be dispensed with by finding a means to render elements soluble by fermentation instead? Where possible, he always allowed chaff and other materials to rot in. To plough in from the previous season would be insufficient to enable it to ferment. The triennial system he thought best. Mr. G. Marshman did not think the ploughing in of the stubble so important as might be considered. If broken up on the red land, working upon the three-year system, the old straw was rolled and thereby the elements were rendered available. A crop of, say, 3 tons, to be chopped up so that it could be ploughed even with disc ploughs and harrowed with disc harrows during wet weather would be impracticable. He had seen a disc-drill rendered absolutely useless through a shower of rain. It would pay to work upon the triennial system in this district, and the stock and green feed were benefited most by it. If the decay of straw could be expeditiously effected, the remedy would be useful. It was a subject that needed scientific treatment. The Chairman said that since the use of harvesters he thought the moisture was better conserved. The chaff thrown out from the machine contributed to this result. In ploughing in stubble the main trouble was to secure its decay sufficiently early for the crop to benefit.

Saddleworth, August 20.

(Average annual rainfall, 20in.)

PRESENT—Messrs. Frost (chair), Cornwell, Graham, Baldwin, and Coleman (Hon. Sec.).

SEARING LAMBS' TAILS.—Mr. Cornwell condemned the use of searing-irons as cruel, and the cause of needless pain to the lambs. When “colt-cutting” many years ago he was asked to dock the tail, and, if when searing round the bone the hot iron touched the bone there were unmistakable signs of sharp pain passing through the animal's body. Mr. Cornwell felt satisfied that this twinge of intense and acute pain was due to the contact of the hot iron with some nerves in the bone, and believed the searing off of the lamb's tail would cause much more pain than if severed by a knife only, though the loss of blood might be more in the latter instance. He considered the practice worse than burning out lampas in horses, and that it should be declared illegal.

Stockport, August 9.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Mitchell (chair), Stribling, Megaw, Whitelaw, Pycroft, Howard, Murray (Hon. Sec.), and three visitors.

HORSE-FEEDING.—Mr. Hewett's paper (from Caltowie report on page 1040 July *Journal*) was read and discussed. A farmer living near Mr. Stribling had put in all his seed and only fed cocky chaff to the horses with two double handfuls of oats, and the team looked well on it. He thought the feeding spoken of by Mr. Hewett too heavy. He gave his horses about 3lbs. oats and 6lbs. chaff for breakfast and dinner, and long hay at night. Mr. Megaw gave his $\frac{1}{2}$ gall. dipper of bran with chaff for breakfast and dinner, and long hay at night. He mixed the dinner feed at breakfast time, and the breakfast feed the night before, well damped. The Hon. Secretary gave each horse 30lbs. chaff per day at cost of

8d., 12 pints oats at 6d., 2lbs. bran at 1½d., equal to 1s. 3d½. per day or 9s. 0½d. per week. This would be £2 14s. 3d. per week for the team of six horses, or £141 1s. per annum. A few years ago he fed his horses heavily, but thought this a waste and that it only excited the team. His neighbor never gave his horses corn, and they looked well; but he was a very careful driver, which accounted for a great deal. The Chairman fed his horses on nothing but long hay until two years ago, and they always looked well. After discussion members considered that three short feeds per day damped, with bran and oats, would be best for working horses.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Arthurton, July 29.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Welch (chair), Bull, Short, Rowe, Lamshed, Westbrook, Crosby, Page, Klim, S. T. Lamshed (Hon. Sec.), and three visitors.

STANDARD WHEAT SACK.—A good deal of discussion took place on this question, and it was resolved that the bag should, in the opinion of this Branch, hold 200lbs. without difficulty, and that the matter should be discussed at the Congress in September.

Arthurton, August 24.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Welch (chair), Williams, Bull, Short, Lomman, Westbrook, Rowe, Klein, A. G. and S. T. Lamshed (Acting Hon. Sec.), and one visitor.

BOT FLY.—Mr. Bull called attention to the ravages of the bot fly, which were in evidence in the district. He knew of four horses dropping dead, which, when opened, were found to be full of the bot fly. Members all agreed that nothing could be done except to guard against the pest in the laying season.

SPARROW PEST.—The Branch resolved that it was a mistake to offer payment for eggs. Members considered that it was best to give the money only for heads, as the birds would go on laying as long as the eggs were taken, while if left to set they would not lay again so soon and the young birds could be destroyed. Mr. Bull's boys had collected no less than 2,400 eggs in one season.

Bute, July 27.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Cousins (chair), Scholefield, Axford, Wauchope, Sharman, McEvoy, A. and H. Schroeter, Masters, Trengove, Stevens, McCormack, Barnes, Commons, Heinrich, and L. McCormack (Hon. Sec.).

CO-OPERATIVE SHEARING.—Members were anxious to see co-operative shearing by contract established in this district, and requested delegates to Congress to obtain all the information they could upon the subject.

LICENSING STALLIONS.—On the motion of Mr. McCormack it was resolved that in the opinion of this Branch all stallions, whether standing or travelling for hire, should possess a veterinary's certificate of soundness and be taxed to produce sufficient revenue to defray the cost of examination by a qualified Government veterinary surgeon. An amendment, which was moved by Mr. Barnes and lost, was that all stallions over two years old should be taxed, whether kept for public or private use, and that legislation should be effected to prevent anyone from offering a stallion for sale unless the animal had passed a prescribed veterinary test. Mr. Masters, in support of the original motion, which was carried, said that as the idea was to prevent the propagation of unsoundness by the use of unsound stallions, it was only necessary to tax those stallions standing for public use. As owners could not expect to have the necessary examination made free of cost, it would be only reasonable and fair to submit to a small tax to cover this expense. He considered that the prices obtained at the recent stallion sale held in Adelaide were lower than the average obtained in previous years, and wondered if this fact was due to wariness on the part

of breeders and dealers, who, in the absence of precautionary legislation in South Australia, were rather afraid of this State becoming the dumping ground for unsound stallions. The Hon. Secretary thought those breeders who kept stallions for private use would be kept up to the mark by competition from those which were hired and had to pass a certain standard. Mr. McEvoy was opposed to either proposal, as he considered that the large majority of breeders were quite capable of judging for themselves and choosing a suitable sire for their stock. Mr. Heinrich feared that unless legislation were introduced to protect the breeders in this State as indicated there would be an influx of unsound sires from the other States, where, he understood, drastic steps were being taken to prevent their use. The Chairman had always been an advocate of licensing certificated stallions only, but considered that to be effective it should apply to all.

Maitland, August 7.

(Average annual rainfall, 19½ in.)

PRESENT—Messrs. Opie (chair), Bawden, sen., Hasting, Jarrett, sen., Jarrett, jun., Lutz, Smith, Tossell, and Pitcher (Hon. Sec.).

NITROGEN.—Mr. Opie read a paper on nitrogenous manures, as follows:—During the past 15 years a marvellous change had taken place in farming operations (at least on Yorke's Peninsula) by the introduction of phosphatic manures, or, as he should prefer to term it, the application of chemical theory to farming practice; and it was only in its infancy so far. Half the scientific farming in South Australia had not been told. It was the duty of every farmer to be an experimentalist. It was his duty to himself and his duty to the State. As population increased the areas of individual farms must become less, and as the natural result the produce of the land must be increased. This could be done; and agricultural colleges and their adjuncts had done much, and would do much more; but the work of experiment belonged to each and all. Therefore, as manures were to-day the dominant note in farming, he had chosen to speak of that essential constituent of vegetable organism, viz., nitrogen. Nitrogen was an odourless, colourless gas, and it constituted by volume four-fifths of the atmosphere. Nitrogen had but a feeble power of uniting with minerals, and if combined was rapidly decomposed. When combined with hydrogen at a proportion of one in three it formed ammonia; and it was assumed that the nitrogen used by plants was derived from the ammonia in the soil and from the surrounding atmosphere. Nitrogen in combination with soda (nitrate of soda) was largely mined in Chili, from which country over a million tons was exported in one year. Another nitrogenous manure in use was guano. This was the dung of sea birds accumulated for many centuries in a climate where there was but little rain to injure it. It was first brought to England in 1839 from beds in Peru, which, in some cases, were fully 200ft. thick. From these millions of tons had now been taken, and the percentage of ammonia had decreased with depth. Sulphate of ammonia, which was largely used in England, was prepared from what was once a waste product from gas works. As with guano, its value depended upon the percentage of ammonia it contained. In this country, however, farmyard manure, if properly treated, was their most commonly used means of applying nitrogen to the soil. When the heaps were allowed to become sodden the black streams of very pungent and offensive matter were being drained into the atmosphere, and the ammonia, worth £100 a ton, was being dissolved in the air. Farmyard manure after being dried and exposed until its value was practically nil, was described as “Drychaff's dung cart, that creaking hearse which carried to the field the dead body whose spirit had departed.” Of late years it had been discovered that leguminous plants, such as peas and beans, enriched the ground in nitrogen rather than extracting nitrogen from it. So the growing of such plants for the purpose of green manuring had been tried with various results. Any of these manures should be used in varying quantities, and results noted. From a series of experiments at Rothamsted, extending over a number of years, the yields of cereals induced by nitrogenous manures had been greatly increased. Mr. Hill had used nitrate of soda at the rate of $\frac{1}{2}$ ewt. soda per acre on the poorest parts of a field of wheat, but could see no difference in the crop. Mr. Bowey thought for the amount of taxes paid by the farmers the Agricultural College should do all the experimenting. [In view of the fact that the best manures for any piece of ground, or the best variety of wheat, &c., can only be determined by experiments on that ground, it will be seen that it would not be possible for the Agricultural College or anyone else to do all the experimenting.—ED.] He agreed that there was much benefit to be obtained by ploughing in green leguminous crops. Mr. Jarrett, sen., had found Peruvian guano the best manure for forcing vegetables some years ago, when he was a gardener.

WESTERN DISTRICT.

Butler, August 2.

(Average annual rainfall, 13in.)

PRESENT—Messrs. Tremberth (chair), Morrisson, Morgan, Young, and Jericho (Hon. Sec.).

CONFERENCE OF WEST COAST BRANCHES.—Members favored a proposal to hold a Conference of West Coast Branches.

FALLOWING.—Mr. Morgan read a short paper on this subject. He advocated fallowing from 2in. to 3in. deep, as the clay in places was very near the surface, and it was not advisable to break the subsoil. He would plough the ground well and then work it down with the cultivator or harrows and before seeding again break it up with the cultivator. Members agreed that it was not advisable to plough more than 2in. or 3in. deep on account of the clay being so near the surface. Most of those present considered that fallowing should take place in July and August, but they considered new ground could be ploughed at any time of the year if the soil was in trim for the plough.

Colton, August 7.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Whitehead (chair), Shepherd, M. and P. Kenny, Hull, Packer, and McBeath (Hon. Sec.).

WOOL VALUES.—Mr. R. Hull read a paper on the question as to whether the wool producers received fair value for their wool. After tracing the processes through which wool passed in process of manufacture into cloth, he expressed the opinion that with woollen goods at present prices it was evident that too many profits were being made, and that the producers were not getting full value for their wool. He thought that if woollen goods were sold at reasonable prices there would be a much bigger demand for it, and the raw material would fetch more.

Goode, August 12.

PRESENT—Messrs. Burner (chair), Will, Watson, Tonkin, Nicholls, Lynn (Hon. Sec.), and five visitors.

CASTRATION OF COLTS.—Mr. Tonkin considered that this operation should be carried out between the ages of five to eight months, as by doing it early the colt did not suffer so much and recovered more quickly. The risk of injury was less also, as at this age the animal was much more easily handled than later on. Mr. Will agreed that to operate early was the more humane method, but considered it advisable to leave it until 12 months to two years old if a good farm horse were required. He admitted that this course entailed more risk than the early operation. Members were divided in opinion as to the best age.

Green Patch, August 16.

(Average annual rainfall, 26in.)

PRESENT—Messrs. Jas. Sinclair (chair), Geo. Sinclair, MacFarlane, A. and C. Whillas, Francis, Chapman, Tidswell, Parker, Gore, Sage (Hon. Sec.), and three visitors.

CONFERENCE FOR WEST COAST.—Members were in favor of arrangements being made to hold a Conference of West Coast Branches.

RAINFALL.—It was reported at the meeting that 10in. of rain had fallen here since July 1st, and over 20in. this year.

YACKA POISONING.—In reply to an inquiry made by this Branch of Mr. H. A. Doudy, Inspector of Stock at Mount Barker, the following information was supplied by that gentleman :—“ After yacka country has been burnt it frequently happens that the young shoots which grow after the fire possess properties most deleterious to cattle. The symptoms associated with the affection are very characteristic, and not likely to be mistaken for those of any other complaint. There is marked loss of proper co-ordination in the hind quarters, great rigidity of the hind legs, and continual overflowing urinary incontinence. In the female the urine escapes in jets, while from the prepuce of the male there is a con-

tinual dripping of urine. The appetite is not much impaired while the patient can get about, but the nervous control is frequently lost, the animal cannot rise, and the trouble terminates in death. It is a spinal affection, and incurable, as far as I am aware."

Koppio, July 29.

(Average annual rainfall, 17in.)

PRESENT—Messrs. Price (chair), G. B. and M. Gardiner, Brennand, Thompson, Richardson (Hon. Sec.), and one visitor.

CONFERENCE FOR WEST COAST.—This Branch decided to heartily support the proposal to arrange a conference of the West Coast Branches.

FODDER CROPS.—Mr. G. B. Gardiner read a paper on the necessity for providing fodder for stock, other than natural grasses, to the following effect:—"It would pay in this district to give more time and attention to this class of cultivation than had been done in the past. It would be admitted by all that fat stock of any description were very scarce and insufficient to supply local requirements, hence there was a good demand at prices that should be profitable to producers. It was a bad advertisement for the district that supplies to such an extent should have to be drawn from the other side of the Gulf. He believed they could alter this state of things and keep a great deal of money in the district that was now sent to the Adelaide market by paying more attention to the cultivation of fodder crops. They might have had fat sheep at the present time if they had planted paddocks with rape and mustard in the early autumn; and at this season of the year, when the growth of grass was so slow, he was sure that every acre of rape would give more feed than 10 acres of natural grass. Then again they found that after the grass became dry it was of very little feeding value, while any sort of green fodder was of great value in keeping stock in healthy condition. They would find it profitable to devote more time to the cultivation of summer fodders such as thousand headed kale, and in some of the best land lucerne could be grown; while there was no reason why they could not have some irrigated plots on most of the farms. Immense quantities of water could be conserved at comparatively little cost, and with irrigation in the summer months there was no reason why they should not grow good crops of practically any fodder. He had seen very heavy crops of mangolds grown on land very similar to some of the local flats, and they were good feed for milking cows, young stock, and store pigs, and he had also known bullocks to fatten on them. Then there were other crops, such as peas, that would fatten pigs or sheep readily. This crop had the advantage of being rather later than wheat, and to be sown after the general seeding was finished. They might also turn attention to such crops as potatoes and onions, which were always in demand, and were almost all imported from the other side of the Gulf. With the advance of settlement in the back country there was sure to be a good demand for such products for a long time, and they ought to be able to defy competition from the other side when they considered the freight, wharfage, and other charges to be met before such products reached them. In these crops the bulk of the work came between the busy seasons in the wheatfields, and by selecting the most suitable spots the return from a few small plots would be equal to a considerable area under wheat. By having a supply of vegetables, &c., for home use they would save many pounds in household expenses." A good discussion ensued, members being agreed that much more could be done in raising fat stock, &c., than was done at present.

SHELTERING STOCK.—The Chairman said he thought that sheds for stock, with a good thick wall of straw for them to pull at, would be of great advantage to them during the cold winter months.

Miltalie, July 31.

(Average annual rainfall, 14½in.)

PRESENT—Messrs. J. W. Atkinson (chair), W. H. Atkinson, G. W. and J. W. Story, W. G. and E. P. Smith, Searle, Howell, Robinson, Laffin, Frost, F. and J. S. Jacobs, Hier (Hon. Sec.), and four visitors.

FARMING IN SOUTH AUSTRALIA.—Mr. W. H. Atkinson read a lengthy paper on this subject of which the following is an abstract:—The best of populations for a young State is a producing one, and it is of as much importance to the Commonwealth as a whole as to the State itself that the producing capabilities of South Australia should be properly developed. There had of late years been considerable development in this direction. Large areas, which a few years ago were covered with dense mallee scrub and simply afforded harbor for rabbits and other vermin, are now productive farms with a fairly large number of workers comfortably settled thereon. There were other large areas of

good land in districts with a fair rainfall, and to develop these will require the toil of thousands of workers, and the results of their labors will be the permanent enrichment of the State and Commonwealth. In the future the production of wheat in South Australia would be an important factor in the world's supply of this grain. The farmers of South Australia have shown that they can, under limited rainfall, produce wheat both as regards quality and quantity with the farmers of any other part of the world. Farming had improved wonderfully in this State of late years, but they were yet only at the beginning of the real progress that would be made. The up-to-date farmer is always anxious to know "the why and the wherefore" of things. They must study and reason out problems affecting their industry. To secure the best profit from their farms they must find out the best varieties of wheat and other grains to grow, the best method of cultivation for their particular conditions, how to make the most of their stock, &c. There was no such thing as standing still; if they did not progress with the times they would fare badly and go back. Each generation has the benefit of their fathers' experience and knowledge, and should therefore be able to achieve better results. The value of their lands would increase as they learned to produce higher returns from them. Farms will gradually become smaller, and their large paddocks would be subdivided in order to better utilise the pastures. There was no doubt they would have to keep a great deal more stock, and constant experimenting would be necessary in order to find out what crops could be most profitably grown for them. It was often difficult for a man with a limited amount of capital to start farming. For such a man it was not advisable to buy land at high prices in the older settled districts, as often it will take all he earns to pay interest on the capital value of his farm, and, besides, when his family grows up he has not sufficient land to give the boys a start on. The man with limited capital can do much better by leasing land in the newly-opened districts. Having no purchase-money to pay at the start he can get a fairly large block, and his limited capital can be spent in improving it. Industrious men can soon make comfortable homes in these districts, and in course of time should not only be practically independent, but be able to give their sons land to farm. Land in new districts must improve in value in years to come, and it would be hard for a really industrious man to make a mistake in settling in such districts. Care must be taken in regard to the men employed on the farm. It does not pay to employ inferior labor; cheap labor is often the most expensive. Farmers should insist on men giving good references before engaging them, and should also see that they do not engage a man who is already in work. Many farmers will offer higher wages to a good man employed on a neighbor's farm when he wants help. This is not only unfair to the neighbor, but foolish, as it simply results in putting up the price of labor against himself. That a good many men engaged on farms were not worth the wages paid was largely the fault of the farmers themselves. The gravest question that confronts the farmer is unionism. The day of individualism had passed; practically every section of the community but the farmers had its union or trade association. Similar action on the part of the producers was absolutely necessary if they hoped to hold their own politically and commercially. The fact that the producers were so disunited gave those who were united a great advantage over them. The Agricultural Bureau had done a great deal to educate the farmers, and he hoped it would be the means of bringing them together in union for the protection of their interests. The Bureau had done a great deal of good in improving farming practices, but he considered much more could be done if each member would do his best. He thought it would be a good plan to offer prizes for the best practical papers written by members of the Bureau. He was also of opinion that a ladies' branch of the Bureau would be useful. The farmers had got a lot of good from meeting together to discuss matters and exchange ideas on the work they had to do, and he could not see why their wives and daughters should not benefit from exchange of ideas on the sections of work which came under their control. The women have to spend their lives on the farm as well as the men, and education and social advantages were equally as necessary to them. The paper was well discussed. It was agreed that farmers should be more loyal to each other in the matter of labor. A good wage should be given to a good farm hand, but they should not entice hands away from other farmers. Members were not in favor of a ladies' branch of the Bureau as suggested by Mr. Atkinson.

Shannon, July 31.

PRESENT—Messrs. J. Cronin (chair), H. and W. Glover, S. and C. Carey, Cronin, L. B., E. B., W., and W. M. Smith, Habner, Proctor, Williams, and J. J. Cronin (Hon. Sec.).

FARM NOTES.—Mr. B. Havellberg's paper on this subject was read and discussed. The writer of the paper claimed that in this new district all should have as much fallow as possible, and get to work to prepare it at soon as seeding was finished. New ground

should be ploughed up roughly, with specially made short mouldboards fitted to the plough, and left in an open state. He would not work fallow again before harvest time, as there were no weeds to kill. As soon as possible after harvest the fallow should be ploughed lightly, or torn up to a good depth with the scarifier. A new settler should if possible plough up 20 acres of ground to a depth of 6in. or 7in. to enable him to sow early green feed. He recommended saving all the drake out of the wheat to boil it for the horses, as a feed of this occasionally was an excellent preventive of worms. They should also have plenty of green feed at the same time. A suitable yard for horses was say one and a half chains square, with protection from the wind all round if possible, either in the form of scrub or artificially made. A shed should be erected in the middle of the yard, and mangers should be provided with lids, to keep the fowls out. A stack of straw in the yard was of great value to the horses, and plenty of bedding should be provided.

Utera Plains, July 24.

(Average annual rainfall, 14in.)

PRESENT—Messrs. Holmes (chair), A. and C. L. Venning, R. and H. Hornhardt, Gale, Barber, Chase, West, J. and M. Abrook, Hill, Stephens, Fulford, Parker, Deer, Ramsey (Hon. Sec.), and one visitor.

BACON CURING.—Mr. R. Hornhardt read a paper on this subject:—Pigs from 8 to 12 months old made the best bacon. They should not be fed on sloppy food, or the bacon would not set firm. He fed heads from the winnower or crushed corn. The pigs did better on that fare than on whole grain. When killed the beast should be let bleed well, with the head lying lower than the hind part. For scalding two parts of boiling water should be mixed with one of cold. He preferred rolled bacon, and described how to cut up the pig for rolling. He made brine for the hams strong enough to float an egg, and at one stage in the process the hams were rubbed well with salt and a little saltpetre. For the roll he used salt rubbed in the rind part till it sweated. The fleshy part was sprinkled with salt and the meat left for two or three days. The fleshy surface was then sprinkled with a thin coat of pepper and spice and a cupful of sugar, after which it was rolled as tightly as possible. A strap was put at each end of the roll to hold it while the binding was done. Hemp was used for this last purpose of a thickness equal to No. 8 wire, and a half-hitch was made every round. The rounds were 3in. apart. The roll was then hung up at once so that it would drain, and in three days was ready for the smokehouse. A good smokehouse could be made from an old 400gall. tank. A hole was made near the bottom of the tank, from which a trench 10ft. long was cut in the ground. This trench was covered with a sheet of iron and a fire made at the end of it. The smoke was drawn along the trench into the tank, and if the fire was kept going four or five days should smoke the bacon sufficiently. Some discussion followed, members generally agreeing with the views in the paper.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Lameroo, July 31.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Eime (chair), Edwards, Dunstone, S. G. and E. J. Trowbridge, Walsh, Marshall, Jeffery, Wittwer, Koch (Hon. Sec.), and one visitor.

FEEDING OFF CROPS.—Mr. S. G. Trowbridge read a paper on feeding off early wheat crops. In a new district such as this feed was not too plentiful. Farming was carried on on an extensive scale, and it was necessary therefore to start seeding early, and some of the earliest crops were likely to be rather forward and suffer from effects of frost when coming into ear. It was therefore sometimes advisable to feed off the crops in its early stages. Wheat should not be fed off after the first week in August, as the plant then became harder and stock would pull a great deal out by the roots. Later feeding off than that did not give the plant a chance to rally. Comeback was a wheat which, when sown

early, benefited by feeding off, as it then stooled much better than if left alone. Dart's Imperial, Silver King, and Yandilla King were wheats which would stand feeding off, but being late varieties did not require it. Sheep were better than horses for feeding off, as they did not cut up the ground or damage the crop to the same extent the latter did. In any case horses should not be put on the wheat in wet weather. Mr. E. J. Trowbridge was not in favor of feeding off the wheat, as he considered what was gained as feed was lost at harvest time; and Mr. Marshall had not seen any crops in the district that really needed feeding off. Mr. Wittwer favored feeding off in July with sheep. He would feed off still later if he was sure of the weather being favorable. The Hon. Secretary always let the young stock on the crop as soon as a good living could be got on the early sown wheats. It saved a lot of hand-feeding. He did not believe in feeding off later than first or second week in August. The Chairman was not in favor of the practice of feeding off crops in this district, as the frost and rain caused the wheat to stool sufficiently.

SEASON'S PROSPECTS.—So far all is promising for a good season. The crops generally are looking very well indeed. There is a much larger area under crop this year than last.

Mannum, July 31.

(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT—Messrs. Walker (chair), Faehrmann, Hein, Heidrich, Schulze, Pfeiffer, Scott, Haby, Greenshields, and Scheutze (Hon. Sec.).

SUMMER FODDER.—The Hon. Secretary read a short paper on the question of summer and autumn fodder crops. He was convinced that they did not make sufficient use of the various fodder plants and shrubs which were at their disposal to provide greenfeed for stock for the end of summer and autumn. He would first deal with the king of fodder plants, lucerne, which he thought every farmer should grow, sowing it broadcast with his wheat or oaten crop. This would give a splendid lot of feed after harvest; it would remain for years and did not impoverish the soil. He sowed about 2lbs. per acre. Another fodder plant which should be more cultivated was the carrot (White Belgium for preference), which grew well on any sandy soil. Stock were very fond of carrots, and as a fodder it was one of the best milk producers, and also very fattening for horses. It was easy to grow 15 tons per acre without irrigation, and they came in just when green feed was scarce. The flowering marshmallow was a handsome shrub, with fine succulent leaves. Cattle were very fond of it. It sprouted again after feeding off and grew to 7ft. or 8ft. in height. Some of the plants were prolific seed bearers. The tagosaste was also very much neglected. It made a splendid breakwind; was good for bees, and very hardy when once established. It should be grown along fences. Mr. McIntosh was advocating barnyard grass (*Panicum crusgalli*) for low-lying swampy ground. It was a good fodder plant, but for all farmers who had not any swampy ground the above-mentioned fodders were well worth a trial. Members were of opinion that it would not pay in this district to grow lucerne in the cereal crops, as advocated in the paper, but admitted that more should be done to provide green feed for the autumn months.

TAKEALL.—Mr. Faehrmann reported that takeall had made an appearance in the crops.

TETANUS.—A three-year-old filly belonging to Mr. Faehrmann had staked herself. He washed the wound with carbolic and she seemed to be doing well, when tetanus set in and she soon succumbed.

VETERINARY EXAMINATION OF STALLIONS.—This branch is of opinion that all stallions hired for service should be examined by a Government veterinary surgeon and be certified sound before being allowed to travel the districts. Since the Victorian Act had been in force stallions had been dumped into the Adelaide market from the sister State.

Renmark, August 2.

(Average annual rainfall, 11in.)

PRESENT—Messrs. Waters (chair), Muspratt, Howie, Braund, Geneste, Weste, Nuthall, Pitt, Taylor, Cole (Hon. Sec.), and two visitors.

PEARS.—Mr. Howie read a paper, written by Mr. Basey, giving some notes on the first export of Renmark pears to London. "Owing to divers factors, and particularly on account of the low non-navigable Murray at the critical time in their venture of shipping pears last year, they were very much handicapped. The Glou Moreaus should have been picked and dispatched at least three weeks earlier; as it was, they were only got forward with great difficulty in time to catch the last steamer carrying fruit to London."

They were unable to get the necessary supply of Laffer cases, so had to pack the pears in kerosine cases and forward them to the Government Produce Depot at Port Adelaide for grading and repacking. The Adelaide purchasers of the balance of the Glou Morceau crop reported that the fruit did not keep as well as it did in the past three or four years. The London lot arrived in good condition, so that the keeping part of the business should not be a worry. It was worth while to remark, however, that the engineer of the *Hector* was reputed to be a 'top notcher' for careful attention to his cold storage chambers, and had a great reputation for landing fruit in first-class condition. The Laffer case had made the export of pears a safe commercial undertaking. The case was made up of three trays, each taking a single layer of pears. When packed, the three trays were placed one above the other, a lid nailed on to the top tray, and the lot cleated together to form one package. Each pear was wrapped in paper (Mr. Sage, a large shipper, who was in Renmark a week ago, told them that wrapping in a double paper was advisable). Below, above, and around each pear wood-wool was packed so that each fruit was isolated from its neighbor, as well as protected from the case. The importance of using plenty of this packing was strongly emphasized. Each case was branded with the number of pears contained, so that buyers knew exactly what they were paying for, and had no cause for complaint upon the score of excessive wood-wool packing. Mr. F. W. Cutlack wrote to his son in London, asking him to report on the shipment on its arrival, and they were indebted to Mr. F. M. Cutlack for his comments, from which the following remarks were quoted:—'The pears were in splendid condition. . . Very little unsound fruit was found in the cases, and the freezing arrangements were evidently excellent. But the grading was extremely bad. The packing was good enough; the grading spoilt everything. Everybody here says the same thing—that it is utterly useless for Australian growers to send anything but the best—the picked best—for which there is always a sale. If the trays had held only the bigger fruit, and none of the useless small stuff, they would have fetched 6s. 6d. more per case than they did, easily.' The London house which handled the consignment reported similarly, but they 'rubbed it in' a bit more; in fact they were scathingly candid! 'We must make a strong protest regarding this fruit; grading was decidedly bad, condition nasty.' Their last lines read, 'London requires good, choice, well-graded pears, as there is only a limited pear trade at this time of the year.' After all this true and tragic story they would be wondering what their account sales looked like! The net return per case was about 2s. better than they made for similar fruit upon the Adelaide market. Taking everything into consideration, and remembering that for them this was a plunge into the unknown and that they had all their experience to buy, the result must, he thought, be considered decidedly satisfactory, and led to the good hope of a remunerative export business being done in Renmark fresh pears. For the future, of course, they hoped to do their own packing and grading in the orchard. They desired it to be understood that they made no complaint against the work done by the Produce Depot, as they recognised that circumstances were against these officers as well as against themselves.' Pruning the Pear.—In the discussions which followed the paper questions were asked as to the proper pruning for the Glou Morceau pear, Mr. Muspratt stating that his young trees ran all to wood in one shoot. No one present had had experience in the matter, but Mr. Taylor remarked that Mr. T. Sage, an orchardist of wide experience recently in Renmark, had pruned some young peach trees in the Pioneer Experimental Plot, and had stated that, as a general rule, up-to-date growers nowadays aimed at producing a very low stemmed, wide spreading tree. Inside shoots were left the first year or two in order to force growth outward, and summer pinching and pruning were freely resorted to. Size of Pears.—A London report (quoted in the paper) urged the sending only of fine large fruit. Mr. Howie stated that Mr. Sage's experience favored a medium sized fruit for export. He was accustomed to pack in three grades, and had never found the largest sized fruit pay so well as the smaller grade. Mr. Muspratt remarked that it was common knowledge that large fruit did not keep so well as the smaller sized. Earlier Shipments.—Mr. Howie stated that their London agent had reported better prospects for earlier shipments of pears. Cost of Cases and Transport.—Stated by Mr. Howie to be 1s. 6d. for the three cleated trays and 6s. for shipping.

PROTECTION AGAINST CODLIN MOTH.—Proposed on the motion of Messrs. Muspratt and Howie, that, in order to protect the district from danger of codlin moth invasion, steps be taken to get legislation passed to prevent the importation into Renmark of any second-hand case of fruit and vegetables (other than onions and potatoes). Mr. Taylor urged that authentic information should be obtained as to the probability of the introduction of moth by means of vegetables before making so drastic a request; but members considered that all the vegetables needed could be grown locally, and the amendment finding no seconder, the motion was carried. It was decided to ask for the co-operation of the Irrigation Trust and the Packing Union.

ORANGE SCALE, &c.—Members reported brown scale to be unusually plentiful this year, some members blaming the olive tree for harboring same. Mr. Muspratt reported a scale of similar appearance to the cottony-cushion scale, which, he said, had first appeared locally in silver wattle trees, the black wattle being also a harbor for the harlequin bug. Mr. Nuthall stated that in South Africa the work done by the Agricultural Departments in suppressing pests and diseases was much more thorough than anything he had seen in Australia. Mr. Muspratt reported having found borers in the limbs of peach trees. Powdered gypsum thrown on the trees was mentioned as a frequently effectual remedy for orange scale. It was resolved to institute inquiries as to the cost of hiring an outfit for fumigating orange trees, and also *re* the appointment of a salaried vegetation diseases inspector for the district.

Sherlock, August 7.

(Average annual rainfall, 15in.)

PRESENT—Messrs. Osborn (chair), Whyatt, Nock, Nicksch, Burnett, S., R. H., and F. C. Stringer, and Coombe (Hon. Sec.).

CARE OF IMPLEMENTS.—The Hon. Secretary read a paper, written by Mr. P. T. Goldsworthy, to the following effect:—“A great deal of carelessness was displayed by farmers in leaving their implements exposed to the sun and rain. The cost of necessary implements to work a farm was no small item, and all implements should be under cover when not in use. He believed it would pay in that district to build a substantial stone shed for this purpose. It would last for years and would be practically fireproof. If this could not be done, some sort of shed could be constructed with bush sides and a straw roof, and that would afford some protection for the machinery. He considered it would pay to give all implements, such as strippers, harvesters, binders, wagons, &c., a coat of paint every other year, or even every year. This would prevent the wood from cracking and warping. Machines should be overhauled as soon as the season's work was finished, necessary repairs made, and all working parts thoroughly cleaned up. A little care of implements saved a good deal of money and made the work much better for man and beast.” Members agreed with the contentions of the paper, and thought that while in use implements should be overhauled twice a day and all nuts kept tight and parts well oiled.

FALLOWING.—Members agreed that fallowing should commence immediately after seeding, but there was considerable diversity of opinion as to the best depth. The Hon. Secretary thought that the ground could be ploughed to a depth of 6in. without turning up a poor subsoil, and that the crops would be greatly benefited thereby. The Chairman considered 3in. sufficiently deep, and several members supported this opinion.

SCRUB-ROLLING.—August and September were considered to be the best months for rolling scrub to get the best results.

Waikerie, August 2.

(Average annual rainfall, 9in.)

PRESENT—Messrs. Rowe (chair), Burroughs, Jones, Lewis, sen. and jun., Modestach, Baum, Rogers, Emmett, Burton, and Green (Hon. Sec.).

PRUNING OF APRICOTS AND PEACHES.—During the day several of the members inspected the Ramco orchards and vineyards. The first place visited was Mr. Green's property, where the visitors were struck with the large healthy apricot trees. The leaders had been allowed to run and were only thinned out in winter. This system had been applied to these trees for some years; the bearing capacity of the trees had been doubled, and the quality of the fruit had improved. The visitors thought Mr. Green had also adopted the correct method of pruning the Foster peach. This had been a source of great trouble to River growers. It could not be brought to fruit by any ordinary peach treatment. Mr. Green thinned this out in winter and did the main pruning after the fruit had set, and then cut out to one bud all spurs that had failed to fruit. He also thinned out the fruit spurs according to the strength of the tree. He used manures, and had to prop the trees for the last two years. Experience had proved that for this variety the fruit spurs must be on two-year-old wood, not the previous season's growth, as usually advocated for peaches. The currants were next visited, where two plots were being experimented with. On vines planted 11ft. by 8ft. he was cutting to one bud and four buds alternately, and on vines 22ft. by 8ft. he adopted the rod and spur system. From rod and spur pruned vines last year the yield was $\frac{1}{2}$ ton currants from quarter of an acre. A move was then made to the other orchards. Most of the growers had adopted Mr.

Green's system of pruning the apricot. In Mr. Jones's well-kept orchard a splendid show of fruit spurs was seen on the apricot trees. This grower is letting the leaders go this year, but is rather doubtful of good resulting. Other orchards were visited where this system was in vogue, but some trees looked sick and weak through letting them run when too young. An adjournment was then made for tea, and a meeting held in the evening. Discussion then took place on this question in view of the afternoon's inspection. Mr. Jones considered that letting the leaders run (called locally long pruning) would tend to draw the sap up and impoverish the lower spurs, and that although the yield might be increased in quantity it would be at the expense of quality. Mr. Green thought that only strong healthy trees should be allowed to run, and by manuring, the spurs would push out from top to bottom. He found he got quantity and quality, and that trees pruned short very often died right out. Finally it was agreed that the system of long pruning was the best for strong growing apricot trees on the irrigated lands of the Murray. Also that the proper method of pruning the Foster peach was to leave the main pruning until the fruit had set, and to take the fruit wood from the two-year-old wood.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, July 27.

(Average annual rainfall, 33in.)

PRESENT—Messrs. Stone (chair), Jacobs, Hicks, Broadbent, C. and J. Lewis, Kayser, I. and G. Ricks, Curnow (Hon. Sec.), and five visitors.

ARBOR DAY.—The Hon. Secretary reported that the Branch had celebrated Arbor Day on July 23rd, when 41 English elms had been planted along the main thoroughfare in the settlement.

CO-OPERATION.—Mr. Yelland, the Secretary of the S.A. Farmers' Co-operative Union, gave an address on this subject, after which it was well discussed.

Forest Range, July 29.

(Average annual rainfall, 36in.)

PRESENT—Messrs. F. Green (chair), Mason, Rowley, Allen, Pollard, R., J., H., and A. Green, Tribe, Hale, Vickers, Monks (Hon. Sec.), and two visitors.

CULTIVATION OF RASPBERRIES.—Mr. Mason read a paper on this subject. The selection of a suitable site for raspberry-growing was of first importance. He preferred land sloping down to the east, so that the plants were shaded from the afternoon sun, with good loamy soil, broken at least 18in. deep. Some people stuck the canes in the ground anyhow and expected them to grow. He considered a quarter of an acre in a good position, well looked after, would give returns equal to an acre indifferently put in and treated. Strong young canes should be chosen for planting, and should be cut well back. They would give more fruit and produce much better canes for the next season than long canes would. He advocated early digging and hoeing. It had been said that late digging did away with the necessity of hoeing. It also resulted in half the crop being lost. Mr. Vickers wished to know why buds were not found low down on the old long canes. Mr. Mason said that if canes were topped they would then bud low down. Mr. A. Green agreed that the deeper the soil was broken up the better for the raspberry canes. If the soil was good it was not necessary to plant so thickly as in inferior land. Mr. J. Green advocated digging canes early in the year. The best situation was sheltered from the afternoon sun. He arched the canes into themselves and they stood up better than those arched into each other. He did not top the canes, as he considered they did not produce so much fruit if that were done. Mr. H. Green thought that as long as young canes for planting had plenty of fibrous roots it did not matter so much about their being extra strong. By leaving canes untopped the fruit ripened earlier. Mr. R. Green cut back young canes when planting. Five or six canes was a fair number to plant to form the stools.

He did not top Fillbasket canes, as the fruit was late enough without. For the old kind 15 or 16 canes in the bush was enough. He had tried arching, twisting, and plaiting, and liked the last method best. The 15 or 16 canes were done up in four or five plaits, and the fruit was easily and quickly picked. Eighteen inches was a nice depth to break up the soil. Mr. F. Green had a few thornless raspberry canes, but they did not compare favorably with the other varieties grown there. They did fairly well for the first two crops, but after that were not of much value. They might be satisfactory for putting in punnets for early market purposes. He considered that as a general rule raspberry canes had been planted too thickly, and was about to plant a new bed with 5ft. between the rows and 3ft. between the stools. He would plant four canes of the old sort and six of the Fillbaskets in a stool. Mr. Rowley asked whether deep or shallow cultivation was better for raspberry canes. At one time the former had been recommended, but now the latter was more in favor. Mr. Pollard had tried arching Fillbaskets. In some places they did well, but in others it did not seem to suit them at all. He thought seven canes a fair number for planting, but considered 5ft. by 3ft. not wide enough. Mr. Monks did not arch canes one into another, but rather favored arching into themselves. He plaited about three together when strong enough, and would never plant closer than 5ft. square. He believed in planting on the square, to allow a free current of air between the plants.

Forest Range, August 26.

(Average annual rainfall, 36in.)

PRESENT.—Messrs. F. Green (chair), H. and J. Green, Rowley, Tribe, McLaren, Hale, Pollard, Allen, Monks (Hon. Sec.), and two visitors.

DRAINING LAND.—Mr. Rowley read a paper setting forth some of the advantages to be gained by draining orchard land. In a district with such a large rainfall as they had here a good system of draining all classes of soils was to be recommended. In low-lying places if the land was allowed to lie wet and sodden trees soon began to show signs of dying back, as the result of the decay of the fibrous roots. In summer the water evaporated, leaving the soil very hard and dry. Cultivation was rendered difficult, and as a certain amount of working was necessary in the summer months to retain in the soil what moisture was there this was a serious drawback. The high land also needed draining as much as possible, as while the water was allowed to soak away through the soil it was continually washing it away and robbing it of the food required by the trees. The best method of draining to adopt depended upon the situation and the nature of the soil. Where there was likely to be much of a stream an open drain was necessary. From this waterway underground drains should branch off through any piece of wet land and to places where soakage could be tapped in the wet weather. Short branches might also be put in to conduct water from the loose cultivated soil into the open drain, thus lessening the amount of "wash" from the banks into the drain. If stone were at hand he would recommend building underground drains with it, bridging over the drain with slabs from 18in. long; but if the soil were very loose or liable to run badly he would prefer to use split timber. In no case should the material be stinted, but plenty of space should be allowed for a clear passage for the water. The drains should be sufficiently deep to allow ordinary cultivation to be carried on over them. Mr. J. Green had tried a good deal of drain construction. Stone drains had not been a great success, and he preferred the slabs of wood about 18in. long and 3in. or 4in. thick. Trees did much better on drained land, and he was satisfied that it paid. Mr. McLaren liked stone drains. They lasted for a number of years if put in properly. Timber drains were also good and lasted well if put in green. The land in this locality required draining and showed good results quickly. Such land seemed to retain the moisture better in summer, although drained in the winter. He could not get on to some of his land before draining, but can now take a horse on it. He had put stones and slabs together with satisfactory results. Mr. A. Green preferred slabs, about 18in. long, put across the drain when they were quite green. He had seen drains made with green saplings which had lasted many years. Mr. Allen said one point not dealt with was draining near creeks. If the land was not drained right through into the creek the water got behind the banks and made them give way. Mr. H. Green thought in low land it was a good plan to plough the ground high, banking it up somewhat before planting trees. Mr. F. Green did not like banking up in that way, he preferred underground draining. Banked up land was liable to wash, and the roots were not drained properly. Drains of green stringybark had lasted about 30 years.

Gumeracha, July 5.

(Average annual rainfall, 33in.)

PRESENT—Messrs. Randell (chair), Porter, Kitto, Monfries, Hanna, Sandercock, and Lee (Hon. Sec.).

FARMING ON A HUNDRED ACRES.—Mr. Porter read a short paper on how to get the best results from a farm of 100 acres. He would divide it into nine paddocks of equal size. If a ring fence was already up, the dividing fence, including gates, would cost about £65 for five plain wires and one barb for the top. The homestead should if possible be in the centre of the farm. The 11-acre paddock in which the house stood could be used for out-buildings, yards, orchard, and growing root crops such as mangolds, swedes, potatoes, or any crop that might be fed to stock. Of the eight remaining paddocks of 11 acres each he would crop three each year, adopting a system of rotation. The first year peas, the next year wheat, and for the third year oats, giving a good dressing of manure each year. The fourth year he would scurry and sow down to grass, such as perennial ryegrass, sheep's burnet, phalaris, paspalum, lucerne, trefoil, and Rhodes' grass. It was advisable to sow a different variety in each paddock to provide a change for the stock, and as the different grasses were at their best at different times of the year a supply of green feed would be secured for a much longer period. All that was grown on the farm should be fed to stock and put on the market in the form of produce, such as butter, cheese, bacon, eggs, beef, mutton, and wool. If so used he was convinced that a higher profit would be obtained from the land in this district than by selling as hay, grain, &c. Three horses should be enough to work the farm, with an extra one for saddle and light harness work. He would keep 16 good milch cows, allowing each cow to be dry six or seven weeks each year. There would then be 13 milking all the year round, and these should produce £230 worth of butter. The pigs, fed on the skim milk and peas, ought to bring in another £100. In addition to 16 cows and four horses the farm ought to carry 30 sheep all the year, or if stores were bought and fattened it should fatten 160, and these should show a profit of £30, making a total profit of £360. Mr. Monfries agreed that it would be best to divide the farm into small paddocks, and to change the cows from one pasture to another from time to time. He could not, however, accept the figures given as regards profits. Mr. Kitto thought the greatest difficulty was to find land suitable for such experiments. He believed in rotation of crops and sowing paddocks to grass if sheltered from frost. Mr. Hanna considered it most important to have land of first class quality. He would sow grasses, and favored prairie grass. The wet district was very much against them, and he did not think the amount of stock mentioned in the paper under discussion could be kept without irrigation. It would not, in his opinion, pay to keep cows in winter. Mr. Sandercock believed in a 300-acre farm divided into small paddocks. He thought the writer's figures were too high. Mr. Randell thought a farm of 100 acres too small, and did not think it possible for cows to return the profit mentioned in the paper. A cow needed 20lbs. of hay or chaff per day, with something added. It would cost about £2 per acre to sow grass, and he thought this was too expensive. In replying Mr. Porter said it was quite possible to work a farm such as he mentioned with three draught horses. He would cultivate phalaris in winter and paspalum in summer.

Hartley, August 4.

(Average annual rainfall, 16in.)

PRESENT—Messrs. B. Wundersitz (chair), O. Wundersitz, W. and C. Brook, Paech, Pratt, Clark, Symonds, Hudd, Phillips, Stanton, Bermingham (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—The meeting was held at the residence of the Chairman, where members met at 10 o'clock in the morning, and then drove four miles to his scrub farm. This land was considered some years ago to be almost useless, but it was now growing good crops. The first paddock inspected was about 70 acres of Yandilla King, which was looking remarkably well. Alongside was a paddock of Federation which was also looking fairly well, but did not seem to stand the cold weather so well, and a hail-storm had knocked it about, but fine weather would soon bring it round again. The Algerian oats were also looking well, being about a foot high in places. One strip of oats had been drilled on top with manure and ploughed in as an experiment, and members considered it looked the best, being the most forward. The kangaroos were getting troublesome again here, eating off the high patches of oats and wheat. They would do a lot of damage if they come in when the crop was getting ripe, as they knocked down so much. The Chairman had a team fallowing close alongside. The soil was sandy in

places, and in others fairly firm ground with plenty of limestone, there being thousands of yards which had been stacked in large heaps at a lot of expense. The stumps were almost all cleared out of the 400 acres with constant ploughing, and there was an abundance of water on the farm at 60ft., some of which was raised with a windmill and used to water the sheep. The farm was all wire-netted and clear of rabbits. In the afternoon members inspected a plot of Yandilla King at the homestead, which the Chairman had worked on the dry-farming principle, but without subsoiling. It looked very much as if it would pay for the extra trouble if it did not go down, as it was quite a foot high and as thick as a mat. A Blackstone oil engine was also inspected which was used for cutting chaff, crushing grain, and sawing firewood—saving a lot of work. The implements were all well housed, and members considered it a very up-to-date farm.

Kingscote, August 2.

(Average annual rainfall, 18½in.)

PRESENT—Messrs. Turner (chair), Wright, Bell, Castine, Thorpe, Jacka, Nash, and Cook (Hon. Sec.), and one visitor.

PEA-GROWING.—Mr. Nash read extracts from the Roseworthy College report dealing with the growing of field peas. Last year he had sown four acres which returned a net profit of £11 per acre. They were planted on the last day of July, but he would advocate planting in June. The variety was Blackeye Susan, introduced to the island 27 years ago by Mr. J. Turner. He always mowed peas with a scythe, put them in cocks, and carted them in early. They were trod out with horses and cleaned with the winnower. Mr. Neaves had planted peas in September, and had a good return. Mr. Turner advocated early planting, say June, as the young plants grew quickly, and by September, when the caterpillars were troublesome, the pods had begun to harden and were not so easily destroyed.

RAPE AND LEMONS.—Samples of rape and lemons were tabled by Mr. Jacka. These were considered to be very fine specimens. Mr. Jacka thought that more rape should be grown on the island, as much of the soil was very suitable.

PANICUM CRUS-GALLI.—Mr. Turner wished to know if there were two varieties of this grass, commonly known as barnyard grass. The Hon. Secretary stated that at the last show Mr. McIntosh, of Murray Bridge, told him that there were two varieties, one of which grew 18in. high, and the true variety, which grew 4ft. to 6ft. high.

Meadows, August 9.

(Average annual rainfall, 34½in.)

PRESENT—Messrs. Ellis (chair), Brook, Catt, Griggs, Nicolle, W. and G. Stone, Smith, Bertram (Hon. Sec.), and one visitor.

PHALARIS COMMUTATA.—Mr. G. T. Griggs read a paper dealing with the improvement of the land, in which he referred particularly to the question of grasses. He had tested many grasses, but none of these had done well in the winter, when feed is badly needed in this district. Last season, about the beginning of August, he bought two packets of seed of *Phalaris commutata* and sowed it on newly-cleared land. He also bought 1,000 plants of this grass and put them out about 3ft. apart each. Most of these grew very well, while the seed also germinated freely, and from one small packet he transplanted about 700 plants. The leaves of the plants grown from seeds were not the same color as those plants he bought. At the end of the summer the plants died off, but a lot of young plants had come up this year, and he was satisfied the seed he secured was that of an annual plant and not the perennial. The roots he bought had made plants about 2ft. in width, and grew 3ft. to 4ft. in height. He believed this would prove a very valuable grass for the district. More attention should be given to draining the land; the water should not be allowed to lie on the surface for more than 24 hours, and under-draining was necessary to carry off the surplus. Most of the land also requires liming; from 8ewts. to 20ewts. of slackened lime per acre should be applied. Without liming they did not get proper value out of the stable manure applied. Thomas' phosphate was a good manure to use in this district, as it contained a lot of lime.

Meningie July 31.

(Average annual rainfall, 19in.)

PRESENT—Messrs. Williams (chair), Scott, T. W. and F. Hisscock, Hacket, Mincham, Ayres, Taylor, Thornley, and Botten (Hon. Sec.).

CARE OF HORSES.—Mr. Mincham read a paper on this subject. It would be a long time before steam or motor power quite superseded horsepower. He preferred dark animals, or bays with dark points, the size and stamp being a matter which depended upon the roads the farmer had to travel and the nature of the country that had to be cultivated. When breaking horses they should always be handled quietly but firmly. He would never hurry a young horse, but bring it to its work gradually, as it would then do much better and have more spirit left in it. He advocated training a horse to obey the owner's voice. Many a life had been saved and many an accident had been prevented by horses promptly obeying their master's voice. It was well to keep horses off the metal roads as much as possible, their legs would then be sounder and the animals would be freer from diseases. When buying they should be sure to carefully examine the hoofs, as a horse might have a beautiful looking body and bad hoofs, which would take more than half the value from him as a working animal. They should not purchase a horse that showed signs of wearing on the inside heels of the front hoofs as they would always have a very ugly action. Damp stables and dirty, sloppy yards destroyed horses' hoofs. They get cold and wet, and remained so for a long time, eventually becoming spongy, when the crust seemed to fret away near the bottom of the hoof, making it very difficult to nail on a shoe. He did not like a hoof that curved from the top to the bottom, for they would often crack and would not stand the rough roads. Rich food would often destroy the hoofs, as was seen in the case of some stallions. This was caused by too much grain in their food. The size of hoofs would, as a rule, depend upon the country the horse was bred in. In rocky northern country they had, as a rule, small hard hoofs, while in the South-East and similar damp districts the horses had large flat hoofs. They grew the kind of hoof best suited for the ground on which they had to work. Sometimes a man who had a large-hoofed horse would say, "Bring the shoe in to encourage the hoof to grow smaller," and the owner of the small-hoofed animal would want the reverse done. In shoeing it was best to copy nature as nearly as possible, for they could not beat what was natural.

BUREAU WORK.—Mr. Mincham also read a short paper on this subject, as follows:—The farmer was often called the backbone of the country, and rightly so in relation to food production. Backbone was needed in bad seasons and in limited circumstances. Bureau members must also put backbone and strength into the meetings. They must be liberal in their views and not too slow in giving them at the meetings when needed. Each member must always be on the lookout for some knowledge, that he might help in the meetings. Farmers knew that they had paid very dearly for some of their knowledge, and the Bureau existed and met so that the experience and advice of others might be benefited by. They all knew that if they read the *Agricultural Journal* they gained a great amount of knowledge very cheaply. The farmer of to-day owed a great debt to scientific men and their researches. Take, for instance, the thousands that had been benefited by using fertilisers. Farmers must always be willing to listen to scientific reports, and try and prove them by practical tests. The future would require far more produce from the soil than that produced to-day, and the farmers would have to face that fact. They must never think they had reached perfection, and that they knew enough. Each year would bring forth some useful discovery that would benefit the farming community. The farmer had a grand occupation, and must always show by his diligent search for knowledge that he had what was essential, in addition to backbone, to make a good tiller of the soil.

Strathalbyn, August 16.

(Average annual rainfall, 19½in.)

PRESENT—Messrs. Fischer (chair), Watt, Collett, Moore, W. M. Rankine, and J. R. Rankine (Hon. Sec.).

EGG CIRCLES.—Circular dealing with starting of an egg circle branch for the district was gone into thoroughly, all the members agreeing that it was a good proposition, and likely to lead to a large business when once started. It was resolved that the members present approach their neighbors on the subject, and that the feeling of the district as a whole be ascertained before the next meeting, by putting an advertisement in the local paper. The Hon. Secretary had sent a copy of the circular to all members.

SOUTH-EAST DISTRICT.

Millicent, August 17.

(Average annual rainfall, 28 $\frac{1}{2}$ in.)

PRESENT—Messrs. Stewart (chair), Harris, Hart, Holzgrefe, Mullins, Mutton, Day, and Thompson (Hon. Sec.).

IMPROVING FERN COUNTRY.—Mr. Day read a paper on this subject to the following effect:—The cultivation of this class of country had not received as much attention as it might in this district, considering the present high land values. They should ask themselves if it paid to leave land practically producing nothing, which, if broken up and sown as cheaply as possible with oats, barley, rye, prairie-grass, &c., for a few years in succession, would be capable of carrying and fattening from one to three sheep per acre for about seven months in the year, and which would, in many cases, with the aid of superphosphates, grow good crops of Algerian oats. Probably the most expensive part of the business was clearing, erecting netting, and thoroughly destroying the rabbits, but there were few who would argue that netting did not pay. There was a mistaken idea that because land was smothered with ferns it was of little value. When ploughed during June or July the ferns were more easily checked than when ploughed in summer. Nevertheless, it was very important to have a crop intended for sheep feed in with the first autumn rains. While it was quite possible to completely destroy ferns in some kinds of sand with a few ploughings, often on better soil it was impossible to do more than check them sufficiently to allow the growth of a crop or of grass. Opinions differ as to the proper quantity of oats to sow per acre (broadcast) on sandy soil, but for sheep feed he considered it paid to sow thickly. When a crop of greenfeed was fit for grazing the point for consideration was whether it was to be used for fattening purposes or simply to be stocked according to its carrying capacity; in either case care should be taken not to overstock at the commencement, and a short spell now and again allowed the crop to recover. One of the secrets of fattening sheep in the winter was providing a change of feed for them, and for this reason it was advisable to sow a variety of fodders. Sheep preferred oats to barley, and cared for rye least of the three. Grazed on systematic lines it was surprising the quantity of stock which could be carried on a small area of cultivated sandy country during the winter, when the rich Millicent flats were cold and feed at a standstill. Although the profit on this class of land, if cultivated, would necessarily be very little for the first year or two, after that time it would be worth three or four times its present value. The matter was well discussed, the members generally agreeing with the paper. That traffic would kill bracken was agreed to by all, but it was pointed out that what might work very well in destroying ferns in some soil would not, perhaps, have the same result in soil of a different nature. Black prairie grass was considered to be the best to sow on timbered and fern country.

FOX DESTRUCTION.—Mr. Holzgrefe spoke on this question. Some time ago he poisoned five sparrows and placed the bodies in his paddocks, with the result that four dead foxes were found lying alongside the trail. One fox which had given trouble for a long time evaded all efforts to lay it by the heels. It refused all manner of enticing baits, until as a last resource he tried a fresh egg. The egg was heavily charged with poison, and the idea was rewarded with success where every other ruse had failed. The fox in question had previously visited his farm each night and always killed a lamb at each visit. The scarcity of rabbits just now was causing a wholesale slaughter of lambs by foxes, and graziers had to keep a vigilant eye on their flocks at night.

Mount Gambier, August 14.

(Average annual rainfall, 31 $\frac{1}{2}$ in.)

PRESENT—Messrs. Sassanowsky (chair), Mitchell, Ruwoldt, Watson, Edwards, Cobble-dick, Pritchard, Sutton, Kennedy, Niquet, Major, Buck, Smith, Dow, Bodey, Engelbrecht, Keegan, Wedd, Innes, G. and D. Collins (Hon. Sec.), and one visitor.

GROWING CLOVER.—At the request of members, Mr. T. C. Ellis, of Benara, furnished some interesting information on this subject. In the early days of the district white clover grew very luxuriantly, and the carrying capacity of the land was high. He had known a 40-acre paddock at Yahl to fatten 1,000 sheep, and there were certainly no paddocks in the district now that would equal this. The clover had largely disappeared of late years, and he thought there were several reasons for this. In the first place the land was then virgin land and better fitted for the production of clover. Further than this there

were comparatively few grasses, &c., competing with the white clover, whereas now numerous grasses, trefoils, and weeds choked out the white clover. He also thought that the summers were not so moist now, and this was an important factor, as white clover required plenty of moisture. Then, again, continual grazing, which destroyed the clover, must not be forgotten. Manuring was also necessary. In New Zealand it was a regular practice to renew their pastures every few years. The grass land was broken and cropped with cereals, roots, &c., for two or three years, and then sown down to grass. Thorough preparation of the soil and a liberal application of lime and manure was considered essential. The clover and other seed was sown either with oats or turnips, and after the crop was taken off the land was left out to grass. After this treatment it produced luxuriant pasture for several years. Liming was considered of special importance, and the New Zealand Government railways carried lime for agricultural purposes free of cost. While he regretted the disappearance of white clover, it must not be forgotten that its place had been taken by a mixture of grasses, clovers, &c., which provided splendid feed for stock. White clover was fertilised by the ordinary honey bees, and there was no necessity for importing the bumble bee from New Zealand, as had been suggested. He was satisfied that it was necessary to renew their pastures occasionally, and when doing so a little clover seed should be sown with other seeds. Ryegrass and clover was a good mixture; the former produced pasture early in the season, while the clover came in later. In this district he thought clover should be sown either in the autumn or early spring. This would do best if sown with oats or barley at the rate of about 12lbs. per acre, and lightly rolled in or covered with chain-harrow. Considerable discussion followed. Mr. Sutton contended that it would pay to allow each paddock to go to seed every second year to renew the pasture. He found white clover very rare, except along the edges of swamps and the sides of the roads, and agreed with Mr. Ellis that it required plenty of moisture. The Chairman thought the failure of the clover was due to lack of cultivation.

Penola, August 15.

(Average annual rainfall, 26½ in.)

PRESENT—Messrs. Strong (chair), Darwent, McBain, Ricketts, Robinson, Williams, Maxwell, McKay, Alexander, Pinches, Richardson, Fullarton, Miller, McDonald, and Adamson (Hon. Sec.).

PIGS.—Mr. Darwent read a paper on the Keeping of Pigs and Curing of Bacon. The first thing to consider was the breed that was most suited to the conditions of the district in which they had to be kept. In the South-East and in the Western District of Victoria the Berkshire had almost undisputed sway. He would, however, prefer a white long-haired Yorkshire and Berkshire cross, or a Yorkshire and Tamworth cross. The Berkshire pure, unless kept to a heavy weight, had a tendency to produce very thin sides. The Yorkshire cross would very much improve this defect in pigs of 150lbs. to 200lbs. weight, and the hams would also be superior. The Yorkshire sow was a better mother than either the Berkshire or Tamworth, and as a rule would have a larger number in a litter. If a Berkshire sire were used the progeny would be piebald, while if the sire were pure Yorkshire the young would be all white. Pigs from this cross matured more quickly than did the pure Berkshire, and should weigh at 9 or 10 months from 200lbs. to 250lbs. He considered it unwise to mate sows before they were about 10 months old, as otherwise they would probably be dwarfed, and they should have two months' rest after weaning in which to gain strength before the second mating. Breeding sows should be kept in good condition before farrowing, but not too fat. If given the opportunity to keep clean the pig was not the dirty animal it was supposed to be. The sty should face the east, with the front open, and with a flap to let down on hot days. The floor should be of concrete with a wooden frame over it, and raised from 8in. to 10in. There should be plenty of room, and not too large a quantity of bedding, as the young pigs were liable to get covered up and overlaid. The trouble of sows eating their young was generally due to feverishness, and this was more likely to occur if too much hard feed was given. Plenty of green feed should be given before farrowing, and if this was not obtainable, bran and a little boiled linseed would have a softening and cooling effect. Wood ashes with plenty of charcoal mixed with them were a good help in keeping pigs in a healthy condition. The pigs should have as large a run as circumstances would permit, surrounded by pig netting, and the feeding trough should be away from the sty. They should be fed at regular times and should receive just sufficient for a feed. He did not believe in the sour swill tub, as pigs did much better on sweet foods. Potatoes and roots should be cooked; grain could be fed dry. When short of feed he had found a few sheaves of oats would keep them going for a time. In regard to killing and curing it was necessary to bleed the pig well. He found that five buckets of boiling water to one of cold invariably gave

a good scald, bringing off the scurf and hair. If the weather was not very cold it was well to cut down the middle of the pig to let the meat cool well before salting. He had dry-salted bacon for many years, and had only had one failure, and that was in thundery weather. Care should be taken not to kill during thundery conditions. He preferred dry-salting, because all the blood drained away and much sweeter bacon was the result. He used for a 200lb. pig 20lbs. fine salt, 2lbs. brown sugar, and $\frac{1}{4}$ lb. saltpetre. The hams and shoulders were pricked all over on the skin side, and rubbed over with a little saltpetre. Salt and sugar was then rubbed all over and the sides piled one on top of the other. These were turned every two days the first week, rubbing in more salt each time, and then turned every third day. The sides would be salted in from two to three weeks, the hams and shoulders taking a week longer. He did not bone the hams, as that process left a nasty hole for flies. They were hung up to dry for a week and then smoked.

Tatiara, August 14.

(Average annual rainfall, 19 $\frac{1}{2}$ in.)

PRESENT—Messrs. Saxon (chair), E. and H. Milne, Kirby, Fisher, Ross, Prescott, Campbell, Duncan, Wilson, Bond, and Truman (Hon. Sec.).

VETERINARY EXAMINATION OF STALLIONS.—The Chairman reported that recently, at the Kaniva parade, he had had a chat with the veterinary inspector sent by the Victorian Government to inspect stallions for soundness and to pass certificates. This gentleman stated that good had resulted from this system. It had the effect of keeping sound stock in the State, while many animals that could not secure the certificate on account of some failing were sent to South Australia. The Bureau should assist the Royal Society at Adelaide to secure the compulsory examination of all horses that entered the show ring. Farmers would then know what class of horse they were securing and would fight shy of the non-certificated animal. The Victorian Government never made any condemnations public, but were willing to point out to the owner the defects of his animal.

BUREAU EFFECTIVENESS.—Mr. E. W. Milne read a paper dealing with Bureau work. He advised all members to take care of the *Journals*, for they would find them useful after many days. He had been looking over some old volumes in the *Garden and Field* and could see that the Bureau had been of immense value to the State. It had obtained and distributed throughout the State information and advice on all practical matters connected with farming, dairying, fruit, tree, and vine culture, advocating such things as change of seed, pickling wheat, spraying trees, growing summer feed, making ensilage, mixed farming, co-operation, disposing of produce and stock, and a host of other things that have been of great benefit to the State. He would very much like to see this society a centre of great usefulness in the district. How was it to be done? The Department of Agriculture was doing its best to help them, and had experts in different departments who were at the disposal of the Branches, and through them were giving instructions and help. He asked, what for? So that they would be able to help others. It was necessary to attend the meetings as regularly as possible, and be on time. It was a good step to success to be punctual. They should come prepared to help the meeting by suggestion, proposition, information, paper, question, or something to show of growth, experiment, or manufacture. There was always something that could be said in the way of criticism, which, if done kindly and with the object of improvement, would be of advantage. Everyone thus doing their part, the meetings would be enjoyable, instructive, and profitable. It was in this as in other things—the effectual working in the measure of every part that would be for the betterment of the whole. But then it was not in the meetings alone that the good would be done. The meetings were the means of circulating knowledge and information. They must experiment in different seeds, trees, stock, &c., and at the meetings make known the results. The homes and farmyards of the members of the Bureau should be models of cleanliness and order. Machinery, &c., should be properly housed, and all should try to be examples worthy of imitation. At the South-East Conference they should make it a rule of honor to make as good a show as possible of the products of their farms, and thus in these and other ways make their Bureau a centre of real good to the district. Several members affirmed their belief in the good work done by the Bureau. Mr. Wilson said the Bureau was the proper place to go to get information on the land, and it had done a lot by its head department in the sending out of experts. People did not realise the work, and the Bureau did not get the credit it deserved. Live Branches had made live districts. Mr. Kirby thought the post card idea a good one; that members be notified what was the subject of the meeting, so that they could post themselves up and be ready to tender any information. Mr. Bond spoke of the good work of the *Journal*. He thought that not sufficient copies came into the district, and was prepared to do all he could at the show to secure subscribers.

AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

Pruning of Fruit Trees, by G. Quinn, 1s.; posted, 1s. 6d.

Vinegrowers' Manual, by A. Sutherland, 6d.; posted, 7d.

Reports of Conferences of Australasian Fruitgrowers held at Brisbane and Wellington, 1s. each, or 1s. 3d. if posted.

Journal of Department of Agriculture of South Australia, 1s. per annum, in advance; 3d. per copy.

Any of the following Bulletins and Leaflets may be obtained by sending a penny stamp for postage:—

Agricultural Miscellaneous: Effect of Formalin and Bluestone on the Germination of Seed Wheat; Milling Characteristics of Australian Wheats; Semi-arid America—Its Climate Compared with that of South Australia; Agricultural College, Roseworthy—Harvest Reports; Agricultural College, Roseworthy—Reports on Permanent Experiment Field; Rust-resistant Wheats; Reports on Agricultural Experiments; Noxious Weeds; The South Australian Wheat Yield, season 1907-8; Improvement of Cereals; Roseworthy Agricultural; Dry-farming in America.

Chemistry and Soils: Soil Surveys; Available Plant Food in Soil; Reclamation of Land.

Horticulture: Select List of Fruit-trees; Preserving, Canning, and Drying Fruits; Fruit-preserving for Domestic Supplies; The Lemon in Sicily; Notes on the Olive; Defects in Export Apples; Apple Mussel Scale; Some Notes on Almonds; When to Apply Bordeaux Mixture; Fruit Flies; Fruit Maggot-fly Pests; The Codlin Moth; Fruit-drying for Beginners.

Stock: Suggestions to Enquirers *re* Stock Complaints; Anthrax; Influenza and Strangles in Horses; Stomach and Bowel Disorders of the Horse; Pig-breeding and Bacon-curing; The Branding of Stock; Preparation of Small Clips for Market.

Poultry.

Dairying: Taints and Flavors in Dairy Produce; Milking of Cows; List of Dairy Factories; Experiments in the Hand-feeding of Cows for Milk and Butter Products; Instructions for Milk and Cream Suppliers.

Spaying of Cows.

THE JOURNAL

OF THE

26 APR 1911
B R A

Department of Agriculture OF SOUTH AUSTRALIA.

No. 3.

OCTOBER, 1909.

VOL. XIII.

Published Monthly by the Department of Agriculture.

All communications to be addressed:

"The Editor, Journal of Agriculture, North Terrace, Adelaide."

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E. H. COOMBE,

Minister of Agriculture.

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POINTS FOR PRODUCERS.

Locust Plague.

The Agricultural Department has been advised that grasshoppers (locusts) are appearing in great numbers in different parts of the north, especially in the Orroroo district and between Wilmington and Quorn. Locusts invariably appear in these districts after a wet winter. Last year they were exceedingly destructive in some parts, and it was estimated that in the Orroroo district the yield of wheat was reduced by fully 2bush. to the acre, while the loss to the dairying industry through the damage done in the pasture was even greater. If this estimate is correct the loss on wheat alone within the boundary of the Orroroo District Council exceeds £15,000. Even if this sum represented the total loss both in crops and pasture it is a serious drain on the resources of the farmers. Last year, on the initiative of Mr. C. J. Tuckwell, the Advisory Board of Agriculture obtained the approval of the Minister to conduct experiments with locust fungus should the locusts appear again this year. Samples of fungus have been procured from the Victorian Department of Agriculture, and Mr. W. L. Summers, Secretary of the Advisory Board, is visiting the Orroroo and Wilmington districts to arrange for experimental work to be carried out there. In South Africa the locust problem is a serious one, and in most of the States the Legislature have taken steps to secure united action in coping with this pest. The locusts can be dealt with most effectively and economically while they are in the hopper stage, and the younger they are the more readily can they be destroyed. The most successful method adopted for the protection of the crops in Natal is spraying the herbage where the hoppers are feeding with arsenite of soda sweetened with sugar or treacle, and it is proposed to test this compound, as well as kerosine emulsion, in our northern districts.

Visit of Professor Perkins to Europe.

Professor Perkins, who has been connected with the Roseworthy Agricultural College since 1892, has been granted 12 months' leave of absence by the Government, to take effect from January 20th, 1910. He proposes visiting the principal European States, together with North Africa, Asia Minor, and Syria. Throughout his journeys the Professor will make inquiries into all questions relating to agriculture and kindred industries, and on his return to the State in 1911 will furnish the Government with a general report, together with as many special reports as his observations may suggest. During the course of his travels he will endeavor to keep the

Minister in touch with whatever he may be doing. The exact itinerary that will be covered has not yet been determined on; indeed it will be left very largely to circumstances. The Professor proposes first spending a month in Egypt, during the course of which he will have occasion to inquire into the working of the Nile irrigation schemes. From Egypt he will probably visit Greece and Asia Minor, where he will come in contact with the currant and dried fig industries. Later on he will visit Tunis and Algiers, where he will have occasion to study matters connected with the agricultural practices of hot, dry countries. In so far as climatic conditions are concerned, both Tunis and Algeria are more akin to South Australia than many of the so-called "Dry Farming Areas" of the United States. Professor Perkins will probably reach Great Britain in June or July. Here he proposes visiting the principal agricultural institutions, as well as farms, flocks, herds, &c. Whilst in England he will secure the Southdown sheep so kindly presented to the Roseworthy Agricultural College by Mr. A. J. Murray. Thence a visit will be paid to France, Spain, and Italy. Here again the principal agricultural institutions will be visited, and a special study made of viticultural questions. Probably also, should circumstances permit of it, Germany and Southern Russia will be visited, and on the return journey Syria and Mesopotamia, where large irrigation works are being put in hand. The Professor wishes also to visit India, but it is doubtful whether time will admit of this.

Spraying for Codlin Moth.

The Horticultural Instructor (Mr. G. Quinn) writes:—"Pear and apple trees are now bursting into full bloom, and the orchardists should have already prepared the necessary appliances and secured the materials required for giving the first spraying for the suppression of codlin moth. It is most important that the first application of the poison should be given immediately the young fruits form, which is indicated by the falling away of the petals from the flowers. There is no doubt that most of our fruit-growers this year will use one or other of the brands of arsenate of lead which are now on the market. Most of these are applied at the rate of 1lb. to 20galls. of water, and they are put up in a paste form and require to be liquefied in a small quantity of water before being placed in the spraying tank. Some of the brands contain much more moisture than others, and this should be taken into consideration when gauging the quantity to be used, as the clear water in this compound as it is purchased from the dealer does not contain any poison, and therefore should not be reckoned in the weight which is used. Although this combination is much lighter than Paris green, and the insoluble particles will keep in suspension much longer than those of the heavier compounds of copper arsenite, yet it is desirable to keep the wash constantly

agitated to secure an even distribution over the trees. Arsenate of lead does not require any lime or lime water, consequently the simplicity of its preparation should recommend it to the orchardists with whom time is such an important factor. In spraying, the poison should be driven into the calix cups of the young fruits, which alone need to be coated with the mixture. As soon as the spray begins to drip freely from the tree no more should be put on, as it is simply wasting material by washing off the poison already applied. A second spraying should be given about eight or ten days after the first, and in most orchards of any size this will mean that by the time the first dressing is applied it is time to begin the second. There is a tendency amongst many growers to imagine that they have little or no fruit on their trees at this stage, and so omit to spray at this early period. Invariably the result of this is that when the volume of the crop is more readily detected much of it has already been infected by the caterpillars of the moth."

Presentation of Sheep and Cattle.

South Australia is fortunate in the possession of a large number of public-spirited men who frequently give evidence of their desire to help the State in which they live in a practical way. Twelve months ago Mr. A. J. Murray, of Mount Crawford, presented the imported Jersey bull Black Antimony and a very fine Jersey heifer to the Government for the dairy department, and a two-year-old Jersey bull to the Agricultural College. Mr. Murray has now offered £100 to enable Professor Perkins, when he visits England, to buy either some high class Southdown sheep for the Agricultural College, or, if Professor Perkins prefers them, some Suffolk sheep. Messrs. Elder, Smith, and Co., on hearing of Mr. Murray's proposal, generously offered to convey the sheep to South Australia free of charge. Both offers have been gratefully accepted by the Government. The dairy herd at Turretfield has also been strengthened by the addition of 12 head of Danish cows, six of which were imported at an average cost of £100. This valuable gift was made on behalf of the Canowie Estate by Mr. F. Rymill.

Orchard Tillage.

The Horticultural Instructor (Mr. G. Quinn) writes:—"A well known orchardist has expressed the opinion that in tilling the land in a season such as this it is desirable to harrow down at the close of each day the area which has been ploughed. As he points out, by doing this no crust has a chance to form upon the newly-turned soil, as it almost invariably does when the sun is shining hotly in spring. As far as newly-planted trees are concerned, cultivation close round them is of very great importance in the early part

of the spring. Assuming that the ground has been dug up with a fork or spade, it becomes necessary to keep it pulverised for a distance of several feet around the stem of the tree, and the best implement for this purpose is a heavy pronged hoe, by means of which the ground can be broken up to a depth of 3in. or 4in. and pulverised to a fine state of tilth. It should be recognised that these trees have not been able to send their roots to any depth in the soil, and consequently must receive close attention in the direction of retaining the moisture close around the stem."

"The Naturalised Flora of South Australia."

This is the title of a useful little book, by Mr. J. M. Black, which is destined to become a standard work of reference for botanists, students of nature, and agriculturists. It is a descriptive handbook of all the introduced plants in South Australia known to the writer, who has for a number of years devoted a good deal of his spare time to searching for specimens in all parts of the State. As Mr. Black points out, no work of this kind has hitherto appeared in South Australia or any part of Australia. The late Professor Tate, in his "Flora of Extra Tropical South Australia" (1890), dealt with only our native plants. Mr. Black has described no less than 368 alien plants which have become naturalised and are propagating themselves spontaneously. The plants are not only minutely described in botanical terms, but the bulk of them are illustrated, the versatility and ability of the author being shown in the excellence and neatness of the drawings, all of which are easily recognisable by anyone familiar with the plants. In addition to the botanical name the common name of each plant is given, as well as the country of origin. For the benefit of those unacquainted with botany, a glossary of scientific terms is published, and there is also a double index—botanical names and common names. Mr. Black's handbook is likely to be extremely useful to advanced classes in nature study, and to the student of botany it will be invaluable.

The Export of Lambs.

The lamb season this year is particularly late. Up to October 2 only 13,000 sheep and 3,000 lambs had been killed at the Government Works at Port Adelaide. The number of lambs coming to hand, however, is daily increasing, and it is expected within a fortnight's time that 25,000 lambs will be slaughtered each week. Last year the season was over before Christmas, but this year it is not expected that the total figures for the season can be made up until well on in January.

Crude Petroleum and Red Oil Emulsions.

"Orchardist" writes stating that he has experienced difficulty in securing a good emulsion of hard soap and crude petroleum, and inquires why this is so. Mr. Quinn forwards the following reply:—"Most likely it is the soap that is at fault, and by using soft soap there would be little difficulty in making a fairly constant emulsion. I would, however, like to warn fruitgrowers against using these crude oil emulsions upon trees after they have burst into leaf and flower, as they are essentially winter washes, and should not be utilised except when the trees are perfectly dormant."

Sheep from New Zealand.

Four years' work at Kybybolite has demonstrated that the Merino is not the proper breed of sheep for that country, and it is now proposed to try Leicester sheep, which will be imported from New Zealand. Professor Angus, who had a consultation with Professor Lowrie on the matter when he was in South Australia, left Adelaide on Tuesday, September 21st, in order to select 50 good young flock ewes, six good stud ewes, and two rams. While in New Zealand he will also inspect a Mole drainer, which is extensively used in expeditiously draining grass land with a clay subsoil, and which it is hoped may be found useful in the South-East. It is said that by its use from 10 acres to 15 acres a day can be drained. Professor Angus will spend a few days in visiting the Government experimental farms and the various sections of the Agricultural Department. It is expected that he will return about the middle of October.

Spray Pumps.

In reply to a correspondent, who asks—"What sort of a spray pump ought I to procure for the purpose of treating about 500 fruit trees?" Mr. Quinn writes:—"The essential features of a spray pump are: It should be strongly made so as to withstand hard work; it should contain a large air chamber to enable a strong pressure to be maintained, and an automatic stirring apparatus should be fixed in the barrel or tank, so that it is impossible to discharge any of the spray compound without it being properly mixed. The tendency amongst manufacturers of the smaller types of pumps has been to sacrifice durability to lightness, and I would strongly advise that wherever the pump has to be carried on a vehicle of any kind the addition of a few pounds in weight so as to increase the stability of it should not be considered a drawback. Many good pumps have been made by fixing a Douglas or Gould force-pump upon a barrel or tank, and having a rotary or semi-rotary paddle fixed in the centre of the vessel to keep the mixture

stirred. A very good apparatus, with a tank to hold about 80galls., can be put together in this way for about from £8 to £10, according to the length of the hoses required. As a rule orchardists find an advantage in utilising a fair length of hose, not less than 30ft., to each outlet, as it enables the person who is directing the spray to encircle the tree without shifting the pump. As far as nozzles are concerned, the cyclone principle is yet the best on the market, and it is strongly urged that no straight jets be used, but those which are set in a curved position, so that the operator, by manipulating the rod on which the jet is fixed, may direct the spray upwards or downwards, or in any direction he may desire by a turn of his wrists. It should be remembered that if the spraying is to be effective it requires to be carried out on the following lines :—The pump must be capable of doing the work correctly and mixing the ingredients as they are forced out through the hose ; an even pressure must be kept up and the spray directed on to the parts of the tree where the disease is to be met. The spray must be applied at the right time, and the proper spray must be used. For instance, Bordeaux mixture is a preventive of fungi, but is useless against insects, whilst on the contrary arsenical compounds are only useful against insects, and then only effective against those which devour their food bodily. Kerosine and other oil emulsions, as well as resin wash and tobacco compounds, are useful against insects which live by sucking up the juices of the plant, as they are destroyed by the reagent being brought into direct contact with their bodies.”

The Veterinary Department.

In consequence of the determination of the Government to examine and give certificates to stallions exhibited at agricultural shows, the Veterinary Surgeon's office has been reorganised and placed under the Chief Inspector of Stock. Mr. Desmond, who has had charge of the veterinary work for some years, will take the position of Government Bacteriologist, and the veterinary staff under Mr. Needham will consist of Mr. J. F. McEachran, M.R.C.V.S. (Chief Veterinary Surgeon), who, until recently, was Inspector of Cattle under the Metropolitan Dairies Board, and Mr. C. A. Loxton (Assistant Veterinary Surgeon). Mr. McEachran has special qualifications for the position to which he has been appointed. He was educated at the Campbelltown Agricultural School, Argyle, Scotland. In 1893, at the Glasgow Veterinary College, he passed the first professional examination and obtained first class certificates in botany, chemistry, and zoology. In the following year he passed the second professional examination, and obtained a first class certificate in senior anatomy. In 1895-6 he passed the third professional examination, obtaining a first class certificate in *Materia Medica* and a second class in veterinary hygiene and diatetics. In the following year he passed the fourth professional

examination with honors, and won the gold medal for the examination of horses for age, soundness, operations, &c. In the same year he obtained the diploma of the Royal Veterinary College with honors, and the degree of M.R.C.V.S. He also obtained first class certificates in veterinary medicine and horse and cattle surgery and in parasitology. From 1897-1899 Mr. McEachran was in private practice in Campbelltown. In November, 1899, he obtained by examination a position as veterinary surgeon and meat inspector in the Department of Agriculture, New Zealand, and remained there until October, 1901. During that time he was engaged in the inspection of meat and dairies, examination of horses for soundness, &c.—especially the horses which went to South Africa with the New Zealand troops and for the Imperial forces—and the investigation of diseases in animals. For five years after that Mr. McEachran was in the Department of Public Health under the New South Wales Government. In 1907 he came to Adelaide, having received the appointment of Inspector of Cattle, Analyst, and Bacteriologist under the Metropolitan Dairies Board, which is composed of delegates from 15 local boards of health. In 1908 he was appointed examiner of the Adelaide branch of the Royal Sanitary Institute, and only recently he received an offer of appointment in the stock branch of the New South Wales Department of Agriculture, which he declined. Mr. C. A. Loxton is a gold medallist of Longerenong Agricultural College, which he entered in 1895. Having won a scholarship at Longerenong, he spent four years at the Melbourne Veterinary College, graduating in June, 1901. He started practice in the Essendon district, and remained there until he was appointed Assistant Veterinary Surgeon in South Australia.

Examination of Stallions.

During the past month the Veterinary Department has been particularly busy, in consequence of the amount of time taken up in attending agricultural shows for the purpose of examining the stallions exhibited. Up to the end of September the Adelaide, Gawler, Balaklava, Snowtown, Eudunda, and Moonta shows had been attended; and the proportion of unsound horses was such as to justify every step that has been taken in the direction of giving the prize-takers at agricultural shows the Government hall-mark of soundness.

Imports and Exports of Fruits and Plants.

The inspectors under the Vine, Fruit, and Vegetable Protection Act of 1885 admitted at Adelaide during the month of August 9,680 bush. of fresh fruits, 6,428 bags of potatoes, 437 bags of onions, and 91 packages of plants; 124 bush. of bananas were destroyed. The exports to inter-State markets

consisted of 10,598bush. of fresh fruits, 2,705 packages of vegetables, and 87 packages of plants—examined at Adelaide; in addition, 223bush. of citrus fruits were passed at Salisbury, and 446bush. of citrus fruits at Renmark. Under the Commerce Act 472bush. of fresh fruit, 254 packages dried fruit, 113 packages preserved fruit, and two packages plants were exported. These were distributed as follows:—For London—48bush. oranges, 100 cases dried fruit, 11 packages preserved fruit; for New Zealand—386bush. citrus fruits, 20 packages dried fruit, 102 packages preserved fruit, and one package plants; for South Africa—134 packages dried fruit and one package plants; for Germany—eight cases oranges; for India and East—30 cases oranges. Under the Federal Quarantine Act 675 packages of seeds and nuts were admitted from oversea ports.

Hot Weather in America.

The following paragraph will doubtless be of interest to many of our readers. A good deal is often made of the very hot dry temperature occasionally experienced in the summer in this part of the world, but even in this matter we cannot beat the American record as quoted. Our shade temperature may show higher figures, but it is neither so trying nor injurious as the more humid atmosphere of other countries:—"During the awful heat that prevailed on the Atlantic Coast during the week of June 21st-26th nearly 100 horses dropped dead in the streets of this city (Manhattan, U.S.A.) each day. The number would have been greatly augmented but for the forethought of the Society for the Prevention of Cruelty to Animals in placing nearly 200 tubs filled with cold water in different parts of the city, where men employed by the society were kept busy spraying over-heated horses as they came along the burning pavements. Arrangements were also made with the Fire Department, by which the hose in each engine-house was used in spraying the suffering truck, cab, and delivery horses. A year's drought in northern Mexico has finally been broken by heavy rainfall. It is estimated that two million dollars will not cover the damage wrought by this prolonged dry weather. The six months of rain failure in Texas scored severely against stock-breeding and dry-farming. In some cases stocks of horses and cattle were removed entirely from ranges which had sustained them for years. A couple of seasons of equitable normal distribution of rainfall in the United States would clinch in striking fashion the claim we make as provisioners to the world."—Extract from the *Breeders' Gazette*, U.S.A.

PLANT AND ANIMAL BREEDING.

INTERESTING EXPERIMENTS AT CAMBRIDGE.

The Agent-General (Hon. A. A. Kirkpatrick) was one of a number of distinguished gentlemen who accepted an invitation from the authorities of the University of Cambridge to visit the University Experimental Farm at Impington on Saturday, July 24th, to inspect the great variety of wheat and barley hybrids and of sheep which the University's Department of Agriculture, under Professor Biffen and Mr. T. B. Wood, have been breeding for several years. In forwarding a number of pamphlets respecting the experiments the Agent-General writes :—" I may add that we were much impressed with the field plots of the new types of wheat, one of which was especially clean, free from rust, and apparently very prolific. This particular type last year gave a return of 58bush. to the acre, and Professor Wood kindly promised to make up a fair-sized sample to be dispatched to South Australia."

The representative of the *Times* who accompanied the party summed up the results of the work at Cambridge as follows :—" The first problem that presented itself was the improvement of wheat. Preliminary investigations, both statistical and experimental, soon showed that there were possibilities of improvement in two directions. The standard English varieties of wheat more than hold their own with any foreign varieties in cropping power, whilst on the other hand the best foreign varieties, on account of their superior milling and baking qualities, are worth 5s. or 6s. per quarter more than the best English wheat. Obviously, it would add something like £1 per acre to the value of the wheat crop if the milling and baking qualities of the best foreign varieties could be combined with the vigor and cropping power of standard English strains. Again, practically all the standard varieties of wheat throughout the world suffer considerably from a fungoid disease known as "rust," which kills off the leaves before they have done their work, and causes a depression in the crop which has been estimated at as much as 30 per cent. The production of rust-proof varieties might consequently be expected greatly to enhance the yield and the value of the crop per acre. If it were possible to produce new varieties combining high cropping power, high baking quality, and freedom from disease, it is not too much to say that the return per acre from the wheat crop might be increased by from £2 to £3 per acre. Preliminary experiments on the University Farm, on lines similar to those followed by Mendel in his historic experiment with peas, at once pointed to the possibility of bringing this about. Hundreds of varieties of wheat were selected from all parts of the world and grown on small test plots under close observation. Practically all of them were found to be valueless for general cultivation in this country ; but a few were found which possessed

some especially valuable features. For instance, several produced grain of extraordinary milling and baking qualities, others were found to be quite immune to the attacks of yellow rust, and others again possessed high cropping power, stiff straw, or other desirable characters. The systematic crossing of such varieties, each with its own good point, has given rise to a number of new types which promise to be of the greatest value. Visitors to the University Farm during the last few weeks have seen the process of wheat improvement in all its stages—the preliminary trials of some curious varieties from Sze-chuan, Tibet, and Abyssinia ; the cross-pollinating of the mother plants ; the resulting hybrids ; the second generation in which the new types make their first appearance ; the fixing of these types on small plots in the bird-proof cage, and the testing of them when fixed in larger field plots ; and, finally, large field plots of several acres carrying magnificent crops of rust-resisting varieties now ripening their grain. Prominent among these were series of plots of new types, whose grain mills and bakes as well as the best wheat imported from Canada, and whose cropping power promises to be at least equal to that of the standard English varieties. The wheat problem which the Cambridge staff set themselves is apparently to all intents and purposes solved, and the new types which will probably be distributed this autumn may confidently be expected to put large sums into the pocket of the farmer and the miller.”

THE CEREAL EXPERIMENTS.

The methods adopted and results achieved in the cereal experiments are thus set out in a pamphlet issued by the University Department of Agriculture :—

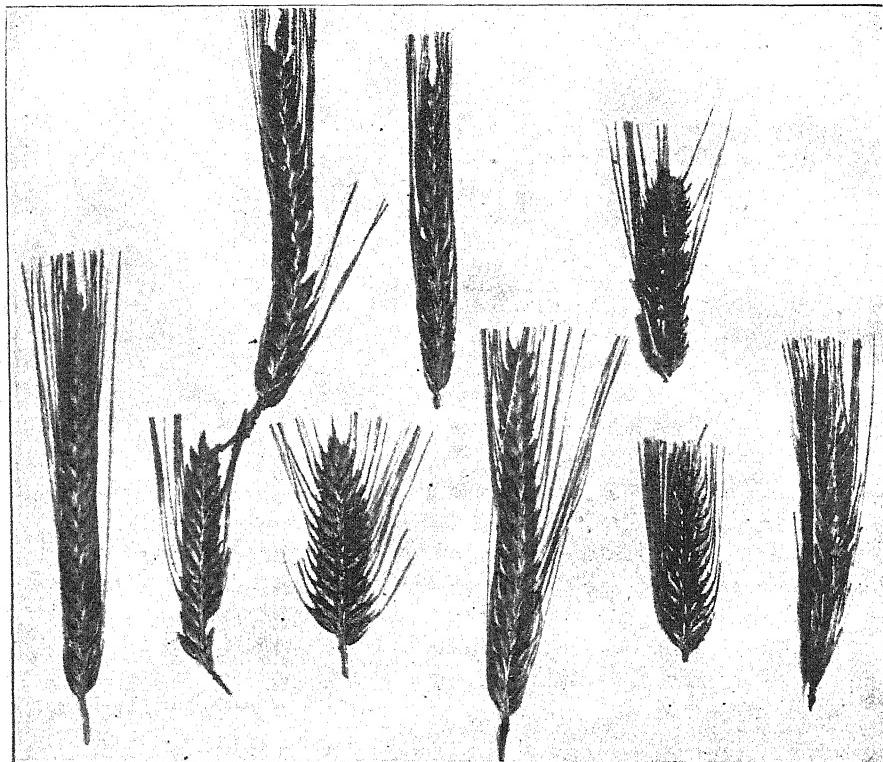
1. The first step was to collect specimens of every known variety of cereals, and grow them under close observation. The majority were found to be quite useless for cultivation under our conditions, and were discarded. Those which possessed even one useful character were kept, no matter how useless they might be in other respects. Thus many English varieties were kept because of their vigor and cropping power, Red Fife from Canada because of its excellent milling and baking qualities, American Club wheat because of its resistance to rust, and so on.
2. Crosses were then made between varieties, each of which possessed certain valuable characters ; for instance, between English wheats, for vigor and cropping power, and Red Fife for baking qualities.
3. The seeds resulting from the cross were sown and seed saved from the first generation (F. 1) so obtained.
4. The seed from the first generation (F. 1) was sown and produced a second generation (F. 2), in which were found plants showing every possible combination of the parental characters.

5. Individual plants, in which the required useful characters of vigor and good baking qualities were combined, were carefully picked out, the seed of each being separately preserved.

6. The seed of each of these individual plants was sown on a separate small plot, and its progeny examined in order to find which of them bred true to type. These were kept and the rest destroyed. Experience shows that a plant which breeds true once breeds true always. This has now been shown to hold true for eight generations.

PLATE I.

Two-row ear parent. First cross. Six-row dense parent.



Descendants of first cross.

7. Seed was saved from those plants which bred true, and sown in small field plots, which were examined again for purity to type. At this stage enough grain is obtained for milling and baking tests. Only those stocks which pass these tests have been kept.

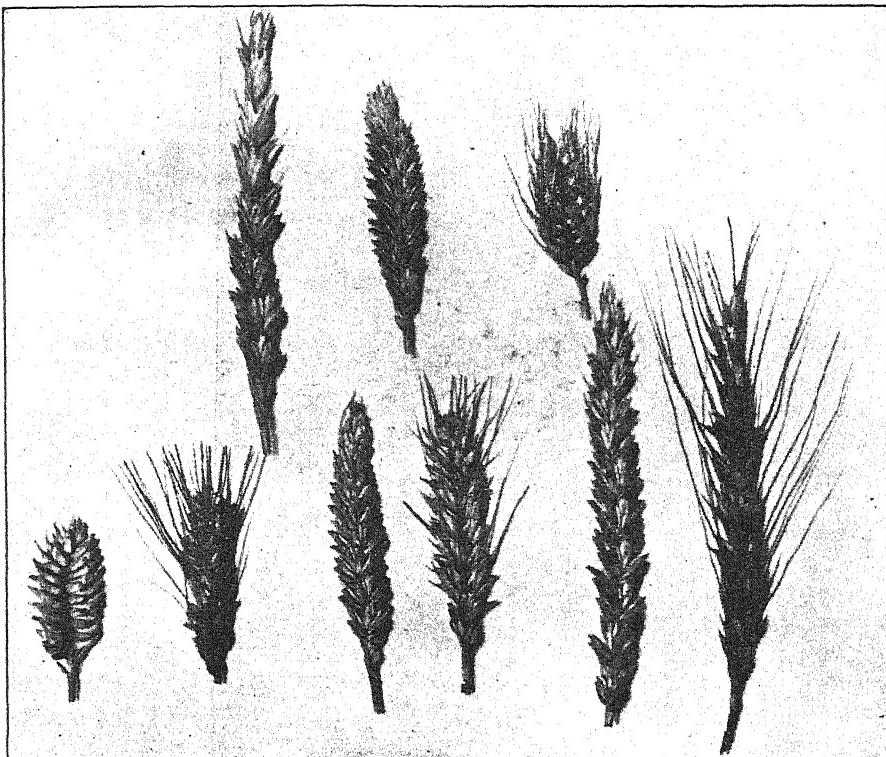
8. The seed from the approved plots was sown in large field plots of one or more acres for tests of cropping power.

9. Having thus obtained new varieties, which combine good yield and baking qualities, these were crossed with American Club in order to add rust resistance, and the above process repeated.

Working in this way it is possible to combine any number of useful characters *in one strain*.

The *first plate* shows the ordinary Mendelian results of crossing two types of wheat, one with long ears and no beard, the other with short bearded ears. Among the progeny two new types were found combining characters derived from each parent—short ear without beard, and long ear with beard.

PLATE II.
Beardless ear parent. First cross. Bearded dense parent.

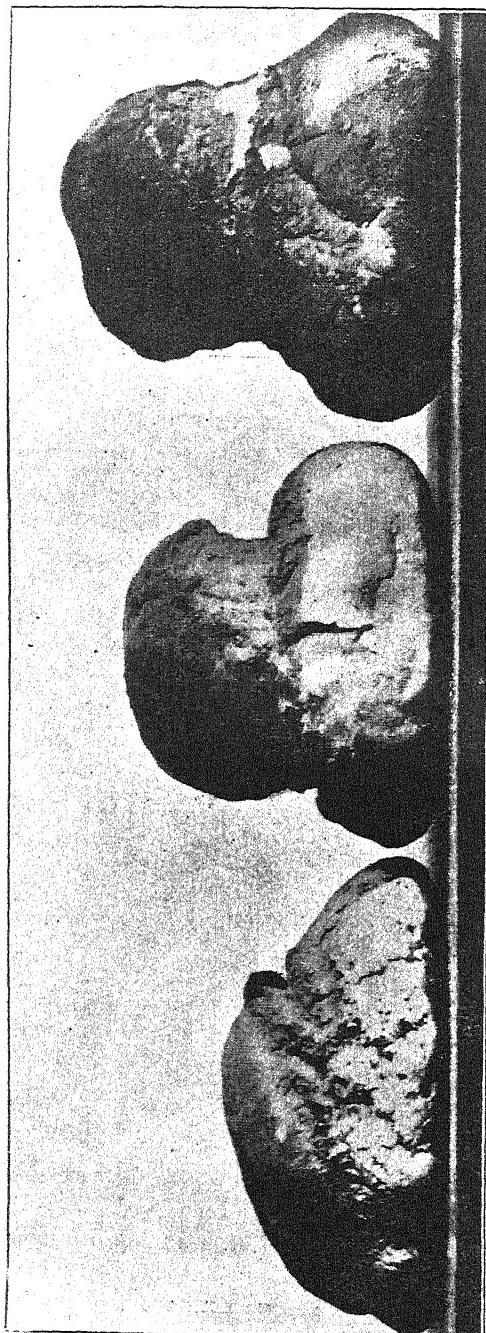


Descendants of first cross.

The *second plate* shows similar results obtained by crossing two barleys—a two-rowed barley with long ears, and a six-rowed barley with short ears.

The *third plate* shows three loaves of bread baked respectively from bad English flour, good English flour, and the best Canadian flour. The difference in market price between good English flour and the best Canadian flour is 4s. or 5s. a quarter, which on an average crop means about £1 an acre.

PLATE III.
Photographs of loaves baked from



Rivet flour,

Average English flour,

In each case the loaf weighs 2 lbs.

The relative strength of the flour used is shown by the size of the loaves.

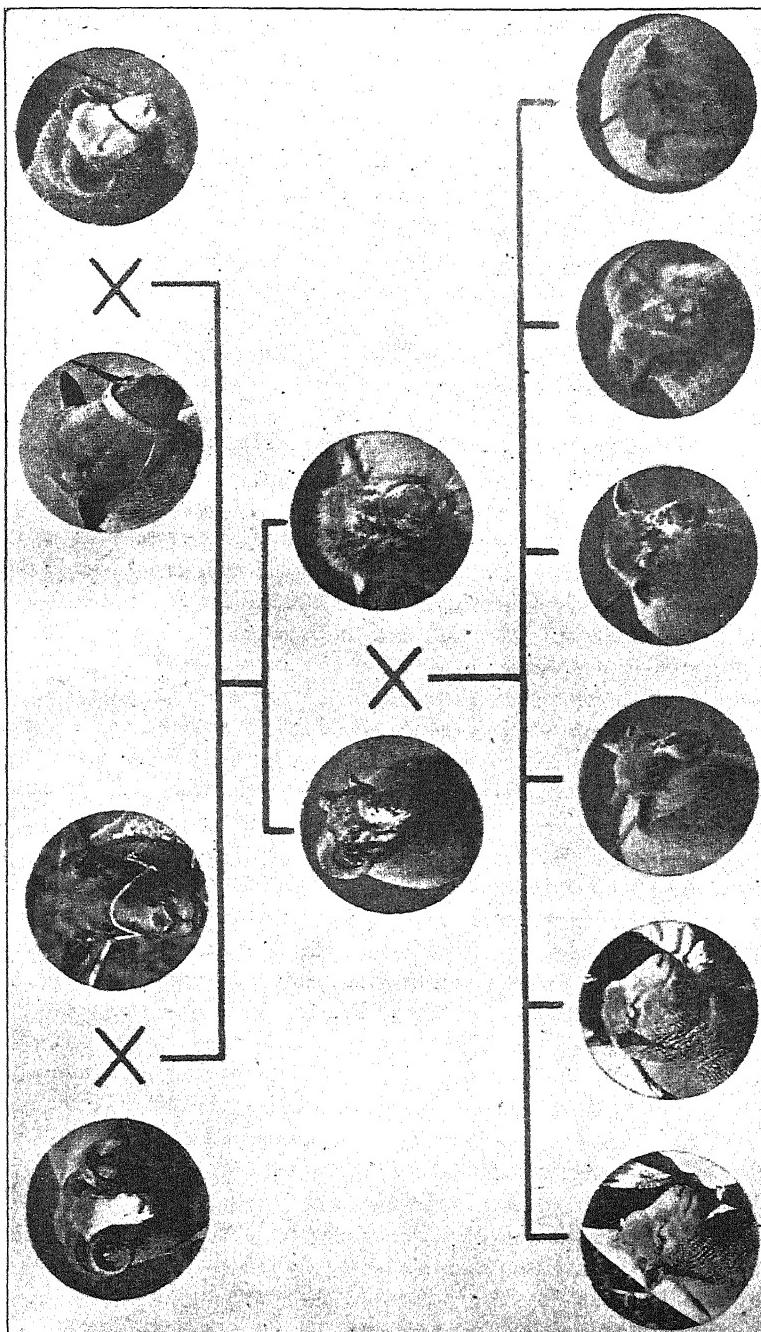


PLATE IV.

On the *fourth plate* are shown the results of crossing two breeds of sheep, the Dorsets, with white faces and horns, and the Suffolks, with black faces and no horns. Mendelian recombination of character is seen in the second generation, as in the case of the wheats and barleys.

THE SHEEP-BREEDING EXPERIMENTS.

The objects of the sheep experiments are described as follows :—

The object of these preliminary experiments is to follow out the inheritance of certain characters in sheep. The characters selected were horns and face color, since obvious characters, such as these are very much easier to follow than wool, carcass, or early maturity.

The breeds selected for crossing were Dorsets and Suffolks. The cross was made each way, Dorset ram on Suffolk ewes, and Suffolk ram on Dorset ewes.

The first-cross animals were the same whichever way the cross was made, all the lambs having black and white speckled faces, all the ram-lambs horns, and all the ewe-lambs no horns.

A first-cross ram was mated with a number of first-cross ewes, and 33 second generation lambs were bred in this way, 21 being rams and 12 ewes. Of the 21 ram-lambs 10 were horned, seven had rudimentary horns or scurs, and four were hornless. Of the 12 ewe-lambs seven were hornless, one had a small scur, and four had large horns.

As regards face color, four lambs of the second generation have had pure white faces, three pure black faces, the remaining 28 speckled faces. Among these 28 the majority have faces which are evenly speckled all over, but in several cases there is a very marked tendency for the black color to confine itself to the tip of the nose, or to rings round the eyes, or to both these places.

It appears therefore that horns and face color in sheep (Dorsets and Suffolks) are inherited in accordance with Mendel's principles, horns being dominant in males, but recessive in females. In face color no dominance is shown ; the two colors are mixed in the hybrids, which when bred together give pure whites, pure blacks, and hybrids again.

These results are illustrated in Plate IV., and show the six types which appear in the second generation from a cross between two strains which differ in two pairs of characters, one pair of which gives an intermediate form on crossing. These six types are :—White face with horns, white face without horns ; speckled face with horns, speckled face without horns ; black face with horns, black face without horns.

The hornless white-faced ram, and the horned black-faced ewe are interesting as showing the recombination of characters, the white face of the Dorset being combined with the hornless condition of the Suffolk in the former, and the black face of the Suffolk with the horns of the Dorset in the latter.

The meaning of the rudimentary horns and the "pattern" assumed by the face coloring is being further investigated.

POTATO BLIGHT.

By GEORGE QUINN, Horticultural Instructor.

LOCATING IRISH BLIGHT.

At the recent Conference of Ministers of Agriculture, held in Melbourne, it was agreed that each State should undertake to investigate the spread of this disease within its borders, and supply each of the other States with a map showing the infested areas, as well as those in which the disease could not be found. This investigation is now being prosecuted vigorously, and progress has been made in most of the States. The Victorian Department of Agriculture has forwarded a map of that State, showing in a distinctive color the parishes in which the blight has been found. Up to the present the blight has only been discovered in three parishes in Gippsland, namely, Doomburrim, Wonga Wonga, and Binginwarri, the two former being contiguous, and the latter only separated from them by a couple of other shires. The Tasmanian department has also notified me that they are forwarding a small map of their State, on which the wards of the municipalities are numbered, each number denoting a potato district. These districts are now being inspected, and the South Australian department will be notified from time to time of those found infected and those in which no disease is discovered.

In South Australia the inspectors are at work in all districts, and up to the present the disease has been located on the plains of Adelaide, from Brighton to Athelstone and Paradise. In this district practically all the potato plots in which potatoes are being grown for market purposes have been found infected. In the southern portion of the hills the disease has been found at Upper Sturt, Coromandel Valley, and McLaren Vale; but the inspector failed to discover any trace of the disease in the neighborhood of Mount Barker and the Meadows. In the South-East the only infected spot up to the present is a small plot in a kitchen garden at the Moorak homestead, where potatoes are being grown for the use of the station. The whole of this patch only covers about eight or ten rods of ground, and arrangements have been made to have the plants destroyed. So far, no infected samples have been forwarded from the Barossa, Clare, or Wirrabara districts; but it is expected that it will be several weeks before it will be possible to compile anything like a complete map on the lines agreed upon at the Conference. The greatest damage has been done in the gardens on the slopes of the hills about Brownhill Creek and Athelstone. In some of these places the crops have entirely collapsed, and are being ploughed over. A number of growers have resorted to spraying the plants with Bordeaux mixture, and the results obtained appear to be somewhat varied. With the help of the dry, warm weather which is

now setting in the plants in some of the gardens which were not very badly infected are recovering and making fresh growth. There appears to be a great number of persons in the State who doubt the accuracy of the diagnosis of this particular fungus. These persons have in many instances been more or less familiar with the occurrence of the disease in Great Britain and other very moist climates, where the disease is, as a rule, much more virulent in its attacks, causing the whole crop to collapse in a few days and to give off a most disagreeable and characteristic odor, and the tubers are seen to be seriously affected without the aid of a microscope. In this State the decline of the plants when attacked by the *Phytophthora* is much more gradual, and owing to the dryness of the atmosphere the rapid putrefaction familiar to European potato-growers is not noticed, and there is an almost entire absence of the characteristic stench. Those, however, who have had an opportunity of examining the infected spots on the leaves under the microscope have not the slightest doubt respecting the identity of the fungus. As is the case with many other parasitic fungi, the climate here undoubtedly tends to mitigate its attacks.

IMPORTATION OF TASMANIAN AND VICTORIAN POTATOES.

There has been a widespread misapprehension amongst potato-growers in the South-East and other portions of the State that Tasmanian potatoes have been coming into this State very freely during the past few weeks. This is not the case, and no potatoes from Tasmania have been admitted into South Australia since the Ministers' Conference. Quite a number of consignments have been brought to Port Adelaide, but owing to the inability of the Tasmanian authorities to give a declaration that they came from clean districts they were refused admission, and have been gradually shipped away out of the State. Victorian potatoes are still being received in small quantities, but in every case they have to conform with the regulations in regard to being placed in new bags and having the grower's name, as well as the number of the shire, stencilled on each bag. They are also accompanied by a certificate declaring that the district from which they come is free from Irish blight.

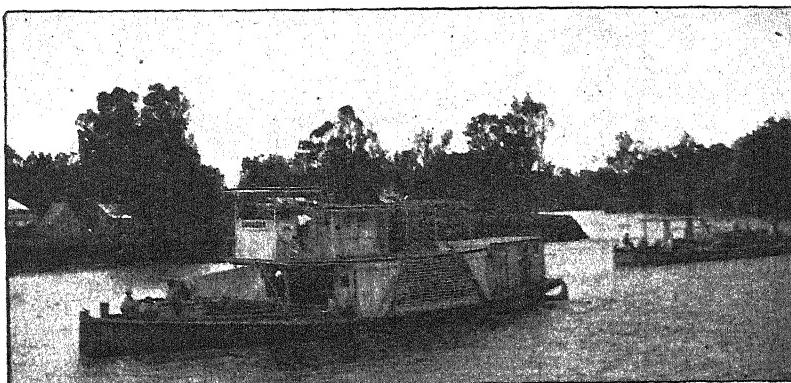
WESTERN AUSTRALIAN RESTRICTIONS ON THE IMPORTATION OF POTATOES.

Since the discovery of the potato blight in several parts of Western Australia the authorities there have removed the total prohibition which they placed on potatoes from the eastern States, and now accept potatoes from Victoria and New South Wales, and presumably from South Australia, if the Government of the exporting State forwards with them a signed declaration that they were not grown within 50 miles of any infected spot. The discovery of a small infected plot at Mount Gambier practically prohibits the exportation of any potatoes from that district to Western Australia; but this

should not prove a calamity, because if many of our potatoes which are now in store are exported we shall be compelled in the very near future to import largely to satisfy local demands.

THE VINE, FRUIT, AND VEGETABLE PROTECTION ACT.

The outbreak of Irish blight has illustrated the comparative futility of the powers conferred by the Vine, Fruit, and Vegetable Protection Act for the prevention of the spread of diseases. Although only occasional plants could be found affected by the Irish blight at the Moorak homestead, the law does not authorise anyone to destroy the plants immediately adjoining those which are infected, notwithstanding that the suspicion respecting their condition may be very strong indeed. With regard to imported plants the necessary power to deal with those which may have come in contact with any found affected by a proclaimed disease is given, but not so where the plants are growing within the State. Further, the people on Kangaroo Island are fearful of receiving infected potatoes on the island, and thus establishing the disease there; but the present law does not provide any powers for inspecting potatoes or other plants which may be in the process of removal from one part of the State to another, and neither is there any power to enable the Government to quarantine any outbreak of a serious disease, excepting the phylloxera of the grapevine.



STEAMER AND BARGE ON MURRAY.

Report on the Amount of Spirits that may be Extracted from a Ton of Raisins.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

REASONS LEADING TO INQUIRY.

In June last I was requested by a firm of distributing merchants to ascertain the amount of spirit that could be extracted from a ton of raisins. In justification of their request they pointed out that in the matter of raisins, local production had overtaken consumption, and that unless some suitable outlet were speedily found for surplus raisins, there was good reason to believe that in the near future growers might find themselves compelled to quit their raisins at altogether unremunerative prices. I was further given to understand that even if surplus raisins should be available in adequate quantities, it was altogether unlikely that a successful export trade could ever be established in this direction. On the other hand there is a good local demand for strong spirit, both in South Australia and the neighboring States, and hitherto distillers, both here and in Victoria, have shown their willingness to avail themselves of surplus raisins in its manufacture. Unfortunately, this season the views of the buyers as to prices did not coincide with those of the sellers ; indeed, at the time that I was approached on the subject it might have proved better policy to export the surplus stock rather than quit it at prices offering. In this question, whilst those who had raisins to dispose of were perfectly aware of the selling price of proof spirit, they were altogether in the dark as to the quantities of it that might be extracted from a ton of raisins ; they were not therefore in a position to determine what these raisins should be worth to a distiller ; and it was this problem that I was asked to solve for them. In the interest of local growers I very naturally agreed to do so ; and for the purpose two samples of saleable raisins were handed over to me, one of which I shall call First Grade Raisins, and the other Second Grade Raisins.

PRELIMINARY STATEMENT.

The work was put in hand towards the middle of June, and towards the middle of July was sufficiently advanced to enable me to advise the firm interested as to the nature of the results secured. On the other hand, as the question appeared to me to be one of general interest, I decided to communicate these results to the Advisory Board of Agriculture at their July meeting. Accordingly, on the 16th of July, after explaining how I came to be interested

in the matter, I informed the Board that my investigations pointed to the fact that from 150galls. to 154galls. of proof spirit might be extracted from a ton of First Grade Raisins ; and from 130galls. to 134galls. from a ton of Second Grade Raisins. And I added that in my view, on this basis, a ton of raisins should be worth to the grower not much less than £20 a ton.

CRITICISM.

I quite anticipated that this preliminary statement would be criticised ; and I was not disappointed in my anticipations. These views of mine were contradicted with gratifying unanimity, both here and in Victoria. Hitherto I have not allowed myself to be drawn into a controversy on the subject ; not that I could not have justified my statements with the greatest of ease ; but because, before submitting my results for the consideration of those concerned, I wished to render my investigations on the subject as complete as possible. These investigations, which have been in hand since last June, were completed last week, and I have now pleasure in submitting a full report on them.

CONFIRMATION OF PRELIMINARY STATEMENT.

In the first place let me state that, after a very full consideration of the question, I am prepared to vouch for the complete accuracy of my earlier preliminary statement. And in doing this I do not for a moment question the good faith of my critics. Without a doubt, one and all believed me to be guilty either of exaggeration, or of a carelessly hasty statement. One and all, however, appear to have committed the pardonable error of imagining that I should have ventured to make a public statement on the subject without having previously investigated the matter. Let me now show by what results I am able to justify my statements.

GENERAL SUMMARY OF RESULTS OBTAINED.

I shall first give in summary the results of six individual experiments :—

First Grade Raisins—

Experiment A.....	155.17galls. of Proof Spirit to ton
Experiment B.....	147.21galls. " "
Experiment C.....	153.77galls. " "

Second Grade Raisins—

Experiment D.....	135.47galls. of Proof Spirit to ton
Experiment E.....	133.51galls. " "
Experiment F.....	137.94galls. " "

It will be noted that the results summarised above, although not absolutely concordant, fully bear out my preliminary statement. What variations exist between them are attributable to a certain lack of evenness in the raisins themselves, some being drier than others ; whilst in some cases there is a greater proportion of dried stalks adhering to the raisins than in

others. Finally, in Experiment B, the figure given is too low, because of certain accidental losses that took place during the progress of the Experiment ; whilst in Experiment F the figure given is too high, because of the fact that in this case all traces of stalks were removed, to appreciate the difference that might arise.

FULL DETAILS CONCERNING EXPERIMENT A.

All these experiments were conducted on the same lines ; and in describing one I shall have described all, and thus avoid tedious and unnecessary repetitions. I select Experiment A for detailed description, and trust I shall be excused for having to follow it out in all its dry technical details.

In Experiment A, 350grms. of raisins (a little over $\frac{3}{4}$ lb.) were first carefully weighed ; each individual raisin was then cut in two with a knife, and transferred to a flask, to which 1 liter of water was added. Subsequently the raisins and water were heated over a steam bath until reduced to a state of pulp. When the liquid had cooled down, additional water was added to make up for the loss by evaporation during the heating process, together with a little ammonium phosphate, to facilitate fermentation ; finally it was sown with yeast prepared from wine lees. Fermentation started on June 18th, and, owing to the low temperature, was not completed until July 6th.

On the completion of fermentation the flask and the fermented raisins were placed on a steam bath, and a constant current of steam caused to pass through the liquid throughout the distillation process. When all the spirit had passed over the distillate was taken and neutralised, and then distilled a second time in the ordinary way. This second distillate was made up to 500 cubic centimeters, or half a liter, and on testing was found to contain 27.7 per cent. of absolute alcohol. This means that all the alcohol produced in the fermentation of 350grms. of raisins was collected in 500 cubic centimeters of liquid of a strength of 27.7 per cent. of absolute alcohol ; and as 1,000 cubic centimeters of such a liquid would contain 277 cubic centimeters of alcohol, 500 cubic centimeters would contain half as much, or 138.5 cubic centimeters of alcohol. From these data it is merely a matter of simple calculation to pass to gallons of Proof Spirit per ton of Raisins. On the basis that one English ton is equal to 1016.064 kilograms, we have—

$$\text{Liters of Alcohol in ton of Raisins} = \frac{0.1385 \times 1016.064}{0.350}$$

and as to convert absolute alcohol into proof spirit, we multiply it by 1.7525, and as 1gall. is equal to 4.541 liters, we get—

$$\text{Gallons Proof Spirit in ton} = \frac{0.1385 \times 1016.064 \times 1.7525}{0.350 \times 4.541}$$

that is to say, 155.71galls. of Proof Spirit to the ton of Raisins.

This experiment, which has been described in detail, is typical of all the others, indicated above ; further reference to them is therefore unnecessary.

APPLICATION OF EXPERIMENTAL RESULTS TO WORKING CONDITIONS.

In the absence of any more adequate argument, it will probably be objected that these are purely laboratory experiments, the results of which are not at all realisable in ordinary practice. It should not be overlooked, however, that providing an assayer is supplied with a true average sample of an ore, he is able to forecast exactly from a very small quantity how much gold will be extracted from tons of material handled in a mine. Personally, I am well satisfied that by quoting 150galls. of proof spirit as obtainable from a ton of First Grade Raisins, and 130galls. from a ton of Second Grade Raisins, I am well within the limits of what is realisable in ordinary practice, providing always that adequately suitable methods of handling the raisins are adopted. There is not the slightest doubt as to the presence in the raisins of an ample sufficiency of material to produce the quantities of spirit indicated by me ; and does it not argue very imperfect methods of manufacture and economically wicked waste, if, as has happened, one of my critics can go so far as to state that in his experience no more than 75galls. to 80galls. of proof spirit can be extracted from a ton of raisins ? In these days of keen competition and industrial efficiency waste of this description is nothing less than a grievous economic sin ; and it surely cannot be suggested that growers must accept absurdly low prices because of the wastefully faulty practices of some manufacturers.

ON THE ALLEGED RATIO BETWEEN FRESH GRAPES AND RAISINS.

One of my anonymous critics, who appears to be a distiller in a large way, although he confesses to no experience in the handling of raisins, makes the statement that he purchased last season 1,512 tons of grapes, from which he extracted wine at the rate of 157galls. to the ton of grapes, averaging 20 per cent. of proof spirit. He then proceeds to point out that this represents about 31galls. of proof spirit to the ton of fresh fruit, and that as one ton of raisins is equivalent to three tons of fresh fruit, according to his returns one ton of raisins should yield not more than 93galls. of proof spirit—that is to say very much less than my own estimates. Unfortunately for my critic's calculations, as I shall presently show, they are based on altogether false premises. I have had no personal experience in the drying of raisins, and cannot therefore from personal knowledge, vouch for the substantial accuracy of the 3 : 1 ratio. I am assured, however, by those competent to speak on the matter, that this ratio is below the actual facts. Apart, however, altogether from the accuracy or otherwise of this ratio, my critic overlooks the fact that the grapes which he purchases for distilling purposes are very far from equalling in sugar contents the Gordo Blanco raisin grapes of the River Murray Settlements. This, however, involved a question that admitted readily of being solved experimentally ; and I determined therefore to do it.

ON THE ALCOHOLIC STRENGTH OF LIQUIDS EXTRACTED FROM RAISINS TO WHICH WATER HAD BEEN ADDED ON THE 3 : 1 RATIO.

I tested this question on both First and Second Grade Raisins. In adding water to these raisins I had to take into consideration the fact that the fresh fruit contained about 5 per cent. of stalks which were not present in the raisins. Having made due allowance for this fact, I extracted from the raisins, after boiling them, liquid at the rate of 150galls. to the ton of fresh fruit. In the case of the Second Grade Raisins, I secured a liquid with a specific gravity of 1112·3 (water equal 1000). On fermentation this liquid yielded proof spirit at the rate of 39galls. to the ton of fresh fruit, or 117galls. to the ton of raisins. The difference between this figure and 130galls. to 135galls. to the ton is represented by what is retained by the skins.

I treated similarly a sample of First Grade Raisins, and extracted from it liquid at the rate of 153·76galls. to the ton with a specific gravity of 1118·4 (water equal 1000). On fermentation this would have given rise to proof spirit at the rate of about 45·32galls. to the ton of fresh fruit, or 136galls. to the ton of raisins. Again the difference between this figure and 150galls. to 154galls. previously indicated represents what is lost in the skins.

ON THE WASTE OF SPIRIT IN THE SKIN RESIDUES.

At this stage in my investigations I thought it well to prove definitely that appreciable quantities of spirit were lost in the skins, when the liquid was distilled apart from them. Unfortunately, by this time I had come to the end of the sample of First Grade Raisins sent me for examination; I was therefore compelled to restrict the experiment to raisins of the Second Grade. This represents Experiment F, previously indicated, which I shall now proceed briefly to describe.

First 250grms. of Second Grade Raisins were carefully weighed, what dried stalks that were present being removed, as has already been stated. Water was added to these raisins on the 3 : 1 ratio, after making due allowance for 5 per cent. of stalks in the fresh fruit, and representing 462·5grms. of water. The mixture was then steamed for about two hours, which was sufficient to bring about the complete pulping of the raisins. The mixture was then thrown on a Buchner funnel, in connection with a vacuum pump, and from it was extracted about 503 cubic centimetres of liquid, representing about 150galls. to the ton of fresh fruit. The specific gravity of this liquid was found to be 1115 (water equal 1000). After fermentation this liquid yielded to distillation proof spirit at the rate of 39·47galls. to the ton of fresh fruit; or 118·41galls. to the ton of raisins.

In the meanwhile the skins from which the liquid had been extracted were mixed with water and set to ferment. On the completion of fermentation the residues were distilled, and yielded proof spirit at the rate of 6·51galls

to the ton of fresh fruit, or 19.53galls. to the ton of raisins ; that is to say at present prices a quantity that is very far from negligible.

If now we add to the spirit distilled from the extracted liquid that distilled from the skin residues we get a total of 45.98galls. for a ton of fresh fruit, or 137.94galls. for a ton of raisins of the Second Grade.

SUGGESTED IMPROVEMENTS IN THE HANDLING OF RAISINS FOR DISTILLATION.

I am now under the impression that I have proved my preliminary statement to the hilt. I have already stated that I readily recognise the *bona fides* of my critics ; there therefore remains to me the somewhat difficult task of pointing to some measures that may possibly lead to the minimising of the enormous losses of spirit that must necessarily occur. I believe that I have dealt in a satisfactory manner with the criticisms of those who rushed into the fray without previous experience of raisin distilling ; there remains therefore for consideration the question as to whether it is possible to improve on the practice of those who can only extract 75galls. to 80galls. of proof spirit to the ton of raisins.

In the first place, I suppose that it is only right that I should point out that, like some of my critics, I have never handled raisins in bulk ; and that further I am not even a distiller. If these admissions serve to discount what gratuitous advice I purpose to offer, I cannot very well help it. I freely admit that there must be many who know much more about this question than I do ; and let it be said that my humble advice is not intended for them. My only claims to a hearing are represented in the fact that over the past four months I have given careful attention and much thought to raisins on a small scale, and entertain the hope that some suggestions I may throw out may be of value to the less well informed.

1. The first difficulty that occurs to me in the handling of raisins that it is intended to distill has reference to the complete bursting of the raisins, so that the sugar they contain may enter into solution in the water that is added to them. I know of no mechanical appliance that would bring this about both adequately and cheaply. No doubt, however, one could very readily be devised. I am of opinion, however, that it would be on the whole unnecessary. In my opinion, if a jet of superheated steam be kept playing in a mass of raisins and water it will soon have the effect of bursting the latter and reducing them to a state of pulp. At all events I have secured laboratory results that satisfy me that such would be the case. This method does not involve the use of very elaborate apparatus, and is easily within the reach of every-day practice.

2. I do not recommend the fermentation of unduly concentrated musts ; there should be in my experience, after allowing for the condensation of the steam, water equivalent to from four to five times the weight of the raisins used.

3. I strongly recommend the use of closed vats for the fermentation of any liquid which is fermented exclusively for the after extraction of spirits ; a small opening should of course be retained for the escape of the gas formed. The large evaporating surface offered by the usual open tank leads to enormous losses of alcohol during the course of fermentation.

4. It seems unnecessary to insist that on cooling the liquid should be sown with carefully prepared yeast, free as much as possible from foreign germs.

5. I strongly recommend mixing with the fermenting liquid from 4lbs. to 5lbs. of ammonium phosphate to the ton of raisins set fermenting ; if the latter substance is deemed too dear ammonium carbonate, although less effective, may be substituted for it. Raisin juice does not ferment nearly as well as the juice of fresh grapes, and the addition of these salts will have the effect of maintaining a good healthy fermentation.

6. And lastly and most important of all, if important losses, representing about 20galls. of proof spirit to the ton of raisins are to be avoided, it is useless to attempt to separate for purposes of distillation the fermented liquid from the skins, or rather the pulp, for it is to that that the latter are reduced. Even when ordinary wine grapes are put through the presses with a view to the extraction of the liquid they contain, considerable losses of spirits take place in what wine adheres to rinds and stalks ; how much greater must be the losses with a substance difficult to handle and press, like raisin pulp, will easily be realised. In my opinion the only way to deal effectively with fermented raisins is to throw the whole mass, both liquid and pulp, into a specially built still, from which a constant stream of steam under pressure will serve to remove the spirit. This is a common practice so far as the extraction of spirit from Grape Marc in South of Europe is concerned, and could without any special difficulty be adopted here for the distillation of raisins.

I do not wish to close this report without acknowledging the valuable assistance lent me throughout the course of these investigations by Mr. W. J. Spafford, Assistant Experimentalist at the Roseworthy Agricultural College.



A COMFORTABLE FARM HOMESTEAD.

NOTES ON KANGAROO ISLAND.

By A. E. V. RICHARDSON, B.A., B.Sc., Assistant Director of Agriculture.

THE IRONSTONE COUNTRY.

There can be no questioning the fact that the ultimate producing power of Kangaroo Island as a whole will largely depend on the capacity of the ironstone soils so characteristic of much of the country. Whatever opinions may be held as to the value of the soil, it is important to remember that in the final analysis the climate is the governing factor in crop production. We can readily make up natural deficiencies of the soil by a rational system of manuring, but we cannot completely make up for shortages in the rainfall; though we may by rational, systematic, and thorough tillage, make the very most of an otherwise scanty precipitation. The rainfall at Kingscote averages 18½ in., and, though no official records are kept of the amount which falls far inland, there is every reason to believe, from local evidence available, that the rainfall is considerably greater than at Kingscote. The average yearly temperature of the island is probably considerably less than that of the bulk of the farming districts on the mainland, and this confers, by lessened evaporation, additional effectiveness to the already ample rainfall. This fact is undoubtedly of considerable importance in any consideration of the productive capacity of a given soil.

Soil fertility is a term that lends itself to many interpretations. Expressed in practical terms it can only ultimately mean productive power, and can only be really measured by the capacity of a given soil for crop production.

Many attempts have been made, however, to express the fertility of a soil in chemical terminology, but it must frankly be admitted that the results are not altogether satisfactory. To appreciate this point it will be necessary to make a slight diversion from the subject matter and consider in an elementary way the nature of plant-food and its position in farm economics.

It has long been a matter of common knowledge that plants need at least 10 different chemical elements for full and perfect growth. These are carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, potassium, calcium, magnesium, and iron. Four other elements are to be found in plants, but they are not generally considered as indispensable to the plant's wellbeing. These are sodium, chlorine, aluminium, and silicon. Plants extract either from

the air, from the soil, or from water these various substances and, after a series of complex changes, build them into new tissue. Of the 10 substances that are considered essential to the plant's welfare, seven are usually present in fairly large quantities, whilst three are commonly deficient, namely, nitrogen, phosphorus, and potassium. This, it must be understood, does not of necessity imply that the total amount of these substances present in the soil is inadequate for the needs of heavy crops. It does imply, however, that at any given time the total amount of what is termed *available* phosphoric acid, nitrogen, and potash is insufficient for the plant needs of heavy crops. Indeed, there is every reason to believe that only a very small proportion of the *total amount* of phosphates, nitrogen, and potash can be regarded as immediately available for the use of the crop. And the whole practice of manuring is based on the fact that these deficiencies in the available food supply of the soil must be made good if heavy crops are to be reaped.

From the standpoint of the chemist, the fertility of a given soil is measured by the amount of these three substances present compared with some arbitrary standard of fertility. It may be assumed, for example, that a good average soil would contain about 1 per cent. nitrogen, 1 per cent. phosphoric acid, and 2 per cent. to 4 per cent. potash. Lime is looked upon as a most desirable and valuable mineral ingredient in the soil, not so much because it is a necessary plant food, as because the presence of a fair proportion of lime is usually indicative of a satisfactory physical and biological condition. The amount of lime actually present varies very considerably, but we may assume that a good average soil would contain from 2 per cent. to 5 per cent. It must not be supposed that mere chemical analysis alone will give an infallible indication of fertility. The weak point in an analysis obviously is that, while it reveals the proportions in which the several constituents are present, it cannot state with accuracy just how much of the plant food is available, *i.e.*, fit for assimilation by the plant. It does, however, reveal the approximate total quantity of the several essential constituents, and thus indicates the sufficiency or deficiency of the essential elements and consequently affords a rational basis for inaugurating a series of tests with fertilisers.

It cannot be denied that the chemical aspect of soil fertility has undoubtedly been unduly emphasized in the past, and this has found expression in the exaggerated importance formerly attached to chemical analysis. But time and again it has been seen in practice that the physical conditions which regulate the supply of air and water to the plant, and, as a corollary, the bacterial life, are far more potent in producing a fertile soil than the mere amount of nutrient material present. Clay soils, to take a single instance, have been known on analysis to reveal no particular deficiency in either phosphoric acid, potash, and nitrogen, and yet, owing to their closeness of texture and the consequent resistance offered to the free movement of air and moisture, have borne very meagre crops.

With this preliminary on the fallibility of chemical analyses, we may safely proceed to consider the merits of Kangaroo Island soils. Samples have been taken from the hundreds of McGillivray, Haines, Seddon; and the following table will give the result of the analyses:—

KANGAROO ISLAND SOILS.

Position.	Nitrogen (N) %	Phosphoric Acid (P ₂ O ₅) %	Potash (K ₂ O) %	Lime (CaO) %
1. Hundred of McGillivray (H. Ayris).	.077	.007	.215	.25
2. Hundred of Haines.....	.014	.007	.058	.056
3. Hundred of Seddon—				
(1) Mount Pleasant.....	.098	.007	.256	.25
(2) Palmer's Block .....	.070	.005	.231	.19
(3) Four miles S.W. from Daw's Diggings.....	.059	.003	.136	.17
4. Experimental Plots (Hd. Seddon)—				
(1) Plot No. 1 .....	.063	trace	.0743	.0987
(2) Plot No. 2—				
Soil .....	.0504	trace	.128	.0423
Subsoil .....	.053	nil	.105	.0705
(3) Plot No. 3—				
Soil .....	.096	trace	.068	.127
Subsoil .....	.061	.037	.136	.028
5. Standard average soil .....	.1	.1	.2	2.3

These figures show that, without exception, these ironstone soils are remarkably deficient in phosphoric acid. Indeed, in several instances the amount actually present is so small that careful chemical analysis reveals only traces of it. The average works out at .006 per cent. It might be mentioned, in passing, that the average of 111 analyses of soils made by the Department of Agriculture works out at .056 per cent. In other words, these Kangaroo Island soils contain approximately one-ninth of the amount of phosphoric acid found in what we might call an average South Australian soil, as revealed by actual chemical analysis, and one-sixteenth of the amount found in our arbitrary standard good soil. The nitrogen figures are, on the whole, satisfactory, though in the case of one soil in the hundred of Haines the amount falls as low as .014 per cent. So far as potash is concerned, the figures indicate no startling deficiency, although several are below our assumed standard of fertility. The soils are generally weak in lime. Whilst the amount of lime actually present in these soils is probably more than sufficient for the direct needs of plant life, there is insufficient lime present to guarantee that desirable physical and biological condition of the soil which lime, in reasonable quantities, is known to confer on soil. The average of 111 analyses of South Australian soils shows the average percentage of lime to be 3.48 per cent., whilst the average amount present in these ironstone soils is only .128 per cent.

The outstanding weaknesses of these soils, therefore, so far as mere chemical analysis goes, are obviously the shortages in phosphoric acid and lime. It would appear that to get good crops from these ironstone soils it would be

necessary to liberally manure them with superphosphate. The beneficial effects of lime would probably be more marked on these soils than on any other soils in the State. Lime would serve to sweeten them, and, besides supplying a necessary plant food, would considerably improve the physical condition. It might be here mentioned that the average and typical iron-stone soil is of a spongy, loamy nature, containing about 60 per cent. fine earth and a fair proportion of ironstone nodules freely scattered through the mass. The subsoil generally consists of heavy yellow clay, wet and cold in character, sometimes coming within a few inches of the surface, but more generally from 9in. to 12in. from the surface. The soils would unquestionably be greatly benefited by the introduction of organic matter into them, and, judging by the vigorous growth of some of the rape, vetch, and pea crops on virgin land in these hundreds, it would appear that organic matter could be readily added to the soil by the ploughing in of such green crops. These soils undoubtedly need plenty of working, and would improve with each year of cultivation, because the free circulation of air which followed such cultivation would gradually counteract the sourness caused by perhaps countless ages of non-aeration. The practical aspect of the question is whether such treatment would ultimately pay.

DEPARTMENTAL PLOTS.

The Department of Agriculture is conducting a series of experiments on the island, with the object of testing the productive capacity of what is known as the ironstone country; and if it can be demonstrated that this type of soil is capable of producing good crops there is unquestionably a good future before the island. Five experimental plots are being worked by the department, two in the hundred of McGillivray and three in the hundred of Seddon. On Mr. Weber's farm (McGillivray) five different variety wheat plots of two acres each were sown on new land. On Mr. Ayris's farm, on a well-drained slope, there are five two-acre variety plots. The land was cropped in 1907 and fallowed in 1908, so that the test will afford some indication of what might reasonably be expected from the ironstone country when fallowed. The varieties tested here are English barley, Charles' Prolific barley, Calcutta Cape oats, Carmichael's Eclipse, and Federation. The three Seddon plots, each of five acres, are situated in the heart of the ironstone country. The plots are situated on undulating land characteristic of the hundred, and are generally well drained. Plot 2 was purposely selected in low-lying country, in order to compare the production of the low-lying areas with the better drained areas on the slopes. The prevailing scrub is small stringybark, yacca, bulloak, and, in the sandy areas, honeysuckle. Each of these plots was sown with Federation wheat, and about 75lbs. super. per acre; and two acres at each plot have, in addition, been top-dressed with 40lbs. nitrate of soda per acre.

The plots will be considerably extended during the coming season, and a vigorous scheme of experimental work will be initiated for testing the various points mentioned above. In addition, some 40 acres of the better quality land has been placed at the disposal of the department for experimental work in 1910.

YACCA GUM AND EUCALYPTUS OIL.

A prolonged visit to the "back country" of the island cannot fail to produce a most marked impression on the traveller making the journey for the first time. Apparently unending expanses of undulating country covered mostly with yacca, broom, and small bushes meet the eye. Occasionally small stringybark, honeysuckle, or narrow-leaf eucalypts help to relieve the monotony of the scene.

As might naturally be expected from the similarity of vegetation, the soil is devoid of the great variety characteristic of so many districts on the mainland. Indeed, once on the ironstone belt proper one may drive for miles without meeting with any appreciable variation in soil types. One cannot fail to be impressed, however, with the possibilities which lie ahead of the yacca gum and the oil industry. On making inquiries from those actually engaged in yacca-gumming on the back blocks, I found that good money could be made at this industry. The men usually work in gangs of three or six. The process of extracting the gum is very simple. One man usually trims the yacca tree, rubs off the charred remains of bush fires, and chops off the leaves. The second man chops off the yacca bark and the shavings fall into a specially constructed receptacle made of bagging supported by a wooden frame, whilst the third operator carries the chopped bark shavings to the "jigger" and jigs it. The fine gum is then ready for market and the coarse gum can be separated by a specially constructed winnower. In conversation with some of these men I gathered that a gang of three men could comfortably prepare 1½ tons of gum ready for market per day, whilst 2 tons could easily be obtained under favorable circumstances. These men were getting 25s. per ton 20 miles back from Kingscote, or £4 per ton at Port Adelaide. Wherever the eye chooses to roam over the tableland of the interior thousands and thousands of acres of scrub, bearing yacca trees in thick profusion, are to be seen. Truly the yacca has here found an environment eminently suited for its requirements. The yacca is apparently used in the manufacture of resins and varnishes, as well as in the manufacture of explosives. If this is so it is quite probable that the price realised at Port Adelaide may not be nearly commensurate with its real value. With the gradual rise of prices characteristic of the past year or two, it is certain that thousands of tons of gum will be annually exported from the island. The only regrettable feature is that the industry is of necessity a diminishing one; but it is safe to say that many years will elapse before the vast territory of yacca scrub will be stripped of its valued possession.

The plant required for the manufacture of oil is of the simplest possible character. Only two 400gall. tanks and a worm condenser are necessary. The theory of oilmaking is simplicity itself. The leaves and boughs of the narrow-leaf eucalypt are packed in a 400gall. tank containing a small quantity of water. The "retort" is then heated and the steam laden with eucalyptus vapor is led away to the worm condenser, in which the steam and oil vapor condense and collect in a suitable receptacle. The "crude oil" thus obtained is subjected to redistillation, and "refined oil" is the product. The amount of oil obtainable from a given quantity of leaf varies with the season of the year at which the leaves are gathered. Men engaged in this work affirm that the yield in winter has fallen as low as 8lbs. oil per still, whilst in summer the same amount of leaf may yield as much as 33lbs. of oil.

A man and a boy can average at least three stills of leaf per day. The refined oil usually realises about 1s. per lb. The profit in such an industry when worked in the leisure months of farm work can readily be calculated, and if a good market could be obtained for the oil abroad, the prospects of building up a payable industry are rosy. It does not necessarily follow that the industry is a diminishing one, like that of gumming, since the trees are merely lopped, and not killed by the operation.

GOVERNMENT EXAMINATION OF STALLIONS.

THE REGULATIONS.

The following regulations, with respect to the examination of stallions, have been issued by the Stock and Brands Department, by direction of the Commissioner of Crown Lands. They were drafted by Mr. R. J. Needham, the Chief Inspector of Stock, who, having been in communication with the Victorian and New Zealand Stock and Brands Departments, has been able to profit by their experience and avoid mistakes which have been made. The regulations are based on the fundamental condition imposed on all agricultural societies, viz.:—"That the awards of prizes in all classes for stallions three years old and over at the Society's Show must be subject to the possession by the exhibit of a Government certificate of soundness."

I.—EXAMINATION PARADES.

1. A list of parades and time table for the season will be prepared as soon as possible.
2. Societies within whose districts an inspection parade is appointed are required to provide a suitable place for the examinations to be conducted, and to suitably and reasonably advertise the holding of the parade on receipt of notice from the Stock Department of the fixture. The secretary, or some member of the committee of the Society, is required to be in attendance at the appointed time to assist the examining officer in the arrangements for the inspection.
3. The parades will be conducted, and the veterinary officer will attend, without expense to societies other than that involved in advertising and making known the occasion to the public and the stallion owners in the district and providing the examination ground.

4. The examining officer will attend inspection parades held at times and places set out in the official time table for the year, and all examinations of stallions for the Government certificate will be made at such parades, or at agricultural shows, or on some such publicly advertised occasion, unless under special circumstances, and with the express approval of the Commissioner of Crown Lands.

5. In the event of it being found impossible for local reasons to hold the parade in any district at the time and date set out in the time table, notice to that effect, together with suggestions for the alternative date and time compatible with the rest of the time table, should be given as soon as possible, after which no alteration in the time table can be made.

II.—GROUNDS FOR REJECTION.

1. Refusal of certificates on the ground of unsoundness will be made only when, in the opinion of the examining officer, the horse is affected at the time of examination with one or more of the following hereditary unsoundnesses, viz.:—Roaring, ringbone, sidebone, cataract, curb, spavin, unsound feet, thorough pin and bursal enlargements, nasal disease (*Osteo-porosis*), chorea (“shivering and nervy”), or such other hereditary unsoundness at the Commissioner of Crown Lands may at any time declare. (Blemishes or unsoundness, the result—in the opinion of the examining officer on appearances then presented—of accident, injury, and over-strain or over-work, will not disqualify.)

III.—CERTIFICATES.

1. Particulars concerning the identity of the horse—name, breeder, pedigree, age, prior ownership, &c.—must be furnished to the examining officer at the time of examination. If deemed necessary in any case the owner may be called upon to furnish a statutory declaration as to the correctness of such particulars.

2. Certificates will be issued within seven days of the holding of parades, and will be forwarded to the secretaries of the societies under whose auspices the parades are held, and who will either forward them to the owner direct or deliver them to him on application.

3. Until the issue of a certificate, or until the publication of the official list of certificated stallions, the result of the veterinary examination will not be communicated to any person except under circumstances as follows:—The examining officer may, on request on proper occasion, communicate to the owner or his agent (duly authorised in writing to inquire) the result of the examination. In cases of refusal of the certificate the reasons for refusal will not under any circumstances—save in legal proceedings, under the direction of the court—be communicated to any person except the owner or his agent duly authorised in writing, and to these only on request in writing. Secretaries of societies, persons in charge of the horse, grooms, or relatives of the owner will not be considered authorised agents for that purpose unless they deliver to the officer the owner's signed authority to receive the information.

4. The South Australian Government certificate of soundness can only be issued in respect of horses three years old and over that have been examined by a South Australian Government veterinary officer, or horses in respect of which any of the following certificates are produced:—

The Victorian Government certificate of sonundness.

The New Zealand Government certificate of soundness.

The veterinary certificates of the Agricultural Societies of England, Scotland, and Ireland.

Any horse which has been rejected by the veterinary examiners of the Victorian or New Zealand Governments or at the shows of any of the above societies is not eligible for examination for the South Australian Government certificate of soundness.

5. The form of the South Australian Government certificate of soundness is as follows:—
Stock and Brands Department No.

[South Australia.]

GOVERNMENT CERTIFICATE OF SOUNDNESS.

Issued for season 190 only (or issued for life, as the case may be), given in respect of the (*breed*) stallion (*name and description of stallion*) submitted for Government inspection by the owner (*name of owner*) of (*address*) at (*place of examination*) such horse having been found suitable for stud service and free from hereditary unsoundness, on examination by (*name of examining officer*) veterinary officer, on the day 19

(Signature)

Veterinary Officer.

Issued by direction of the Commissioner of Crown Lands.

(Signature)

Chief Inspector of Stock,

6. Two-year-old colts may be submitted for examination, and a temporary certificate will be issued in respect of such as pass the examination.

IV.—TENURE OF CERTIFICATE.

1. Only stallions five years old and over will be given life certificates. Three-year-old and four-year-old stallions will be certificated for the season only, and will be required to be submitted for re-examination each season until five years old, when a life certificate will be issued.

2. The season certificate issued in respect of any horse must be handed to the examining officer at the time of re-examination, or forwarded to the Chief Inspector of Stock before a subsequent season certificate or a life certificate will be issued.

3. The Commissioner of Crown Lands retains the right to at any time have a certificated stallion submitted for re-examination, and to withdraw the certificate in the event of the animal being declared, to his satisfaction, unsound.

V.—DEATH OR TRANSFER.

1. In the event of the death of a certificated stallion, notification thereof must be at once forwarded to the Chief Inspector of Stock, with particulars as to description of horse and number of certificate.

2. On the sale or transfer of a certificated stallion the vendor or transferor must at once notify the Chief Inspector of Stock, stating name and address of new owner or transferee, giving name and description of horse, and number of certificate.

VI.—BOARD OF APPEAL.

1. Any owner of a stallion who is dissatisfied with the refusal of a Government certificate in respect of his horse may appeal against the decision to the Commissioner of Crown Lands at any time within 30 days of the examination, under the following conditions :—

(a) That the appeal be in writing, and be accompanied by the lodgment of £5, such amount to be forfeited in the event of the appeal not being upheld, unless the Board shall, for good cause, otherwise direct.

(b) That the appeal be accompanied by an undertaking to pay any railway fares and hotel expenses incurred by the Board of Appeal in connection with the settlement of the appeal.

(c) That, in the event of refusal, the appeal to be accompanied by a certificate from a qualified veterinary surgeon setting out that the horse has been found by him, on examination since the refusal appealed against, to be free from all the unsoundness set out in Part II. of these regulations.

2. On receipt of notice of appeal in proper form, and with above conditions complied with, the Commissioner of Crown Lands will appoint a Board of Appeal, which shall consist of—

(a) In the case of appeals against refusal of certificate, the Chief Inspector of Stock and two duly qualified veterinary surgeons.

Such Board shall act and decide on the appeal, and its decision shall be final, and not subject to review.

3. In the event of the appeal being allowed, refund shall be made of the deposit, and any expenses paid by the appellant under clause 1 (b). Further, the Board may recommend to the Commissioner of Crown Lands the allowance of such of the expenses of the appellant in supporting his appeal as it may consider reasonable under the circumstances of the case, and the Commissioner of Crown Lands may, in his discretion, confirm the recommendation in whole or in part, whereupon allowance shall be made to the appellant accordingly.

4. No stallion in respect of which a Government certificate is refused will be allowed to be resubmitted for examination, except in the case of an appeal as herein provided for. In the event of any rejected stallion being resubmitted for examination under another name, or under such circumstances as in the opinion of the Commissioner of Crown Lands are calculated to mislead the examining officer into the belief that the horse has not previously been examined, the owner of such rejected stallion, if proved to the satisfaction of the Commissioner of Crown Lands that he is responsible for such resubmission, shall be debarred from submitting any horse for examination for such period as the Commissioner of Crown Lands shall determine.

TRIAL OF STONE-GATHERING MACHINES.

The trial of stone-gathering machines for the bonus of £100 offered by the Government took place at Paskeville on Friday, September 3rd, in the presence of a large number of farmers and others. Unfortunately the heavy rainfall during the winter had caused the ground to set hard, and the stones were too firmly embedded in the soil to give the machines a fair trial on stubble land, while it was quite impossible to go into the fallow. Generally speaking, the stones were also too small for a proper test being made of the capabilities of the machines.

The general arrangements for the trial were in the hands of a committee of the Advisory Board, consisting of Professor Perkins, Messrs. A. M. Dawkins, G. R. Laffer, and W. L. Summers (secretary). Local arrangements were entrusted to the Paskeville Branch, the members of which provided 25 horses, free of charge, to work the machines. The judges were Messrs. A. Goodall, of Paskeville; Paul Roach, of Kadina; and J. L. Williams, of Roseworthy Agricultural College.

Five machines took part in the trial. Mr. W. Heithersay, of Belalie North, showed a lightly constructed machine, triangular in shape and about 6ft. in width in front. This gathered the stones together into a hopper at the back, which, when full, was tipped in the rows as the machine was moving. The machine was too light, while the hopper worked badly; but as a stone-gatherer it did better work than any other machine. The opinion was freely expressed that it could be made very effective at little cost. It was priced at £10, and required only three horses to work it.

Mr. J. C. Davies' machine was constructed on the stump-jump principle, was triangular in shape, and about 12ft. in width. The stones were collected into a hopper at the rear; but here again this did not work too well. By the substitution of tines for the shares this can be converted into a cultivator. The machine was priced at £50. Six horses were required to draw this machine.

Mr. A. Burnham, of Burra Burra, New South Wales, attempted to put the stones into rows about 10ft. apart with a machine constructed in the shape of a triangle, but drawn from the point instead of from the wide end, as with the other two machines. This did fair work, and would probably be much better suited for loose ground and where large stones were plentiful. The machine was drawn by four horses and priced at £56.

Mr. C. Smith, of Ardrossan, had a somewhat similar machine to that entered at the previous trial. The stones were loosened by means of spring steel tines and directed to the large 7ft. wheels with 12in. flanges, which should have elevated the stones into hoppers. It was priced at £50 and drawn by four horses, but failed to do good work.

Mr. J. von Bertouch, of Kapunda, also attempted to gather and lift the stones into hoppers with the same machine as previously exhibited. This was drawn by five horses and priced at £100, but failed to achieve the desired end.

In judging the machines the following points were taken into consideration :—(1) Efficiency, (2) gathering stones free from soil, (3) cost of clearing, (4) lightness of draught, (5) strength of machine, (6) simplicity of construction and working, (7) cost of machine.

The judges reported as follows :—We regret to have to report that none of the machines did work of a satisfactory character, and we are therefore unable to recommend the payment of the full amount of the bonus offered by the Government. Mr. W. Heithersay's machine did the most serviceable work at the trial on land fairly free from stumps, but we are of opinion that on stumpy land the machine entered by Mr. J. C. Davies, of Port Pirie, would be more suitable, as it is constructed on the stump-jump principle. Mr. A. Burnham's machine is also promising, and we would suggest that Messrs. Heithersay, Davies, and Burnham be granted a small bonus. In view of the fact that two at least of the machines promise, with slight structural alterations, to be fairly effective, we would recommend that a further trial for the balance of the bonus offered be held in February or March. We would strongly recommend intending competitors at any future trial not to attempt to pick up the stones, as gathering them into rows or heaps will meet the requirements of the farmers. We would also call attention to the necessity for keeping down the cost of the machines ; as, unless they can be sold at a moderate price, there would be very little demand for them, even if fairly effective. While we regret the failure of this trial, we would point out that, owing to the excessive wet season conditions were not very favorable ; but, in spite of this, two of the machines showed a decided advance on those exhibited at the previous trial.

On the motion of Mr. Heithersay, a vote of thanks was accorded to the judges, and the majority of the competitors intimated their intention of taking part in the proposed trial if the judges' recommendations were adopted. General regret was expressed at the comparative failure of the machines, but it was agreed that better work was done by several than at the previous trial.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, September 8th, there being present Messrs. J. W. Sandford (chair), G. R. Laffer, C. J. Tuckwell, R. J. Needham, C. Willcox, Professor Perkins, J. Miller, and Col. Rowell.

The Secretary read report on recent trial of stonemasons at Paskeville, and some discussion followed. Professor Perkins spoke very favorably of Mr. Heithersay's machine. This, though too light, was very cheap, simple of construction, and did fairly effective work. He intended to purchase one for the College, as with a little alteration he was certain it would do good work. Mr. Willcox supported. He was much impressed with the machine shown by Mr. Heithersay.

Approval was given to the formation of a Branch of the Bureau at Kalangadoo.

The Secretary called attention to the fact that in several instances members of Branches who had, in accordance with the rules, retired at the end of the year owing to non-attendance, had been renominated, although they had been absent for as many as five, six, and in one case eight, consecutive meetings. The object of the rule that one-third of the members of each Branch should retire in June of each year was to keep the rolls purged of those members who would not attend meetings. It was resolved that the Secretary should inform these Branches that the Board could not at present see its way to reappoint the gentlemen in question, but if later on they expressed a desire to again become members their names could be submitted in the usual way.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. T. Phillips and W. Hefford, Hartley ; J. and L. Phillis, Coomooroo ; F. Gardiner and A. Price, Koppio ; W. L. Symons, H. L. Will, and J. W. Whitelaw, Goode ; W. T. Schapter, W. H. Jenkinson, N. G. Snyed, and W. H. McMurray, Woodside ; E. E. Hunt, Morphett Vale ; T. J. Quinn, Mount Bryan East ; J. R. W. Rackham, Lucindale ; A. Farrow, Kybybolite ; J. Greig, Port Pirie ; J. Millard, Kadina ; H. De Witte, Dr. P. Guinard, Renmark ; H. Strange and J. Strange, Cherry Gardens ; J. G. Lomman, F. J. Lower, F. H. Jessop, A. A. Alexander, A. H. Appleby, Inkerman ; W. Coe and C. Tiller, Port Germein ; C. Schultz, Pine Forest ; T. C. Ellis, Mount Gambier ; W. H. Scott, A. Eliot, T. Fogerty, Yongala Vale ; C. Haymen and A. Luxom, Forster ; F. C. Heinzel, A. G. Neindorf, A. E. Gray, O. Heinzel, R. Norman, W. Threadgold, L. Lecor, and L. K. Short, Parrakie ; T. Cox, sen., Redhill ; C. Kitto, Saddleworth ; D. Ramsey, Miltalie ; A. S. Payne, Rhine Villa.

Some discussion took place in reference to Irish potato blight and the importation of potatoes from Tasmania. Mr. Sandford pointed out that owing to the South Australian department permitting potatoes to be imported from Tasmania West Australia had refused to permit our potatoes to be introduced there. The result was disastrous to Mount Gambier growers, as not only was the local price affected by the Tasmanian supplies, but our outside market was blocked.

Mr. Tuckwell called attention to the amount of feed in different parts of the State which could be profitably converted into ensilage, and regretted that so little attention was given to this question by growers. Mr. Miller agreed, and said he believed that many farmers were under the impression that the making of ensilage was difficult and costly. On the motion of Mr. Tuckwell it was resolved that the Hon. Minister be asked to arrange for several object lessons in the making of ensilage being carried out by the Agricultural Department.

ANALYSES OF ARSENATE OF LEAD.

At the request of the Executive Committee of the South Australian Fruit-growers' Association, the Hon. the Minister of Agriculture gave instructions that samples of the different brands of arsenate of lead offered on the local market were to be obtained and analysed. Samples were submitted to the Government Analyst, who reports results of his analyses as under:—

Brand.	How Sample Obtained.	Lead calculated per cent.	Moisture calculated per cent.	Arsenic, as PbO.	Total Arsenic, as As ₂ O ₃ .	Water-soluble Arsenic, as As ₂ O ₃ .
Nicholls'	Purchased by Dept.	25.95	48.99	15.62	0.08	
Swift's.....	" "	47.10	35.66	15.17	0.35	
Blue Bell	Submitted by agents	39.10	42.87	12.72	0.07	
Austral,	" "	59.47	27.87	8.87	0.06	
Platypus	" "	68.90	22.87	7.01	0.10	

It may be mentioned that the samples of Austral and Platypus brands contained a proportion of clear liquid on the surface of the paste, but as there was nothing on the packages to suggest that this should not be used when spraying, the actual contents were analysed, with the results stated.

The necessity for exercising some supervision over the sale of arenate of lead has been receiving consideration from the United States agricultural authorities, and legislative action has been recommended. On the advice of the Association of Economologists and Official Analysts of the United States a Bill has been drafted to deal with the sale of insecticides, and the section dealing with arsenate of lead reads—

“ That for the purpose of the Act an article shall be deemed to be adulterated—in the case of arsenate of lead—

- (1) If it contains more than 50 per cent. of water.
- (2) If it contains total arsenic equivalent to less than $12\frac{1}{2}$ per cent. of arsenic oxide (As_2O_5).
- (3) If it contains arsenic in water-soluble forms equivalent to more than 0.75 per cent. of arsenic oxide (As_2O_5).

TESTING ARSENICAL SPRAYS.

The Horticultural Instructor (Mr. G. Quinn) writes:—“ The Department has arranged, through Mr. T. Sage, the Inspector of Orchards in the Barossa district, to carry out a comparative test of the value of several brands of arsenical sprays that are at present on the market. For this purpose a small orchard belonging to Mr. H. Kennedy, containing about 100 apple trees in full bearing, situated near Lyndoch, has been selected. This has been carefully set out in sections, some of which will be sprayed with one of the arsenical mixtures, while other sections will be kept as checks. In one section the trees will be bandaged without being sprayed, and in another nothing at all will be done beyond collecting the infected and sound fruit. A careful record will be kept of the infected and sound fruit of each section, and the caterpillars caught in the bandages. It is hoped that this will prove a valuable demonstration, as well as a test of the merits of the various brands of spray. The particular compounds to be utilised having been tested by the Government Analyst, the work will be started with a full knowledge of the nature of the reagents used against the codlin moth. Some of the sections of the orchard will be treated with Bordeaux mixture for the purpose of testing the value of this fungicide against black spot (*Fusciplodium*) of the apple.”

AGRICULTURAL BUREAU CONGRESS.

TWENTY-FIRST GATHERING.

The Twenty-first Annual Congress of the Agricultural Bureau was begun at the School of Mines on Monday evening, September 13th, when a large number of delegates were present. Throughout the succeeding sessions the attendances were most satisfactory, and the agenda paper, which was of a rather important character, produced splendid discussions. During the sittings the following delegates attended:—Amyton—S. Thomas, A. Wallace, T. O'Donohue, and P. Griffin; Angaston—S. O. Smith, J. E. Swanr, and R. Waters; Appila-Yarrowie—J. Wilsdon; Arden Vale and Wyacca—M. Eckert, J. Williss, and G. Miller; Arthurton—A. G. Lamshed and J. Welsh; Balaklava—J. J. Helleur and O. Uppill; Beetaloo Valley—W. P. Fradd, A. Bartrum, and J. L. Murphy; Belalie North—R. J. Atkin and D. Smart; Bowhill—E. P. Weyland and E. Drogenmuller; Brinkworth—W. B. Davis and T. Brinkworth; Bute—J. Wauchope, L. McCormack and F. Masters; Caltowie—J. Potter and J. G. Lehmann; Carrieton—J. Ormiston and F. Kaerger; Clare—C. Jarman; Clarendon—S. White, A. Phelps, and T. B. Brooks; Colton—P. P. Kenny and R. Hull; Coomooroo—E. Hall and E. Berryman; Coonalpyn—E. Masters (sen. and jun.), and H. Bone; Cradock—J. McAuley, J. Paterson, and T. Fitzgerald; Crystal Brook—T. L. Kelly and M. Weston; Cummins—P. O. S. Cooper; Davenport—J. Roberts and A. Gosden; Dawson—E. W. Smart and C. H. Meyers; Dingabledinga—F. DeCaux and J. McMurtie; Forster—J. Searle and W. Searle, jun.; Fowler's Bay—C. B. Atkin; Gawler River—F. W. Roediger and F. E. Winckel; Georgetown—J. King, S. Eyre, and J. Fogerty; Geranium—M. Alford and A. Cooney; Golden Grove—A. D. N. Robertson; Greenpatch—W. M. McFarlane; Gumeracha—W. Jamieson, M.P., J. Sandercock, and A. Cornish; Hartley—B. Wundersitz and W. Birmingham; Hawker—J. Smith; Inkerman—F. C. Saint and T. Smart; Johnsburg—L. Chalmers; Kadina—J. Malcolm and A. Paterson; Kanmantoo—F. Lehmann; Keith—R. P. Draper and J. A. Lock; Kingscote—P. T. Bell; Kingston—R. Jackson; Koolunga—J. Sandow and W. Perrin; Koppio—G. Price, H. Roberts, and F. Gardiner; Kybybolite—G. H. Hahn and A. R. Scholz; Lameroo—W. J. Trowbridge, R. Walsh, and S. G. Trowbridge; Lipson—G. Provis; Longwood—J. R. Coles; Lucindale—H. Langberg and S. Rayson; Lyndoch—F. K. Warren and W. Hammatt; Maitland—H. G. Tossell, E. G. Jarrett, and C. B. Hasting; Mallala—M. F. Worden; J. Nairne, and G. Marsham; Mannum—A. Faehrmann and G. A. Lenger; Meningie—J. Williams and W. H. Mincham; Millicent—H. A. Stewart

and M. H. Day ; Miltalie—Searle and T. P. Howell ; Minlaton—F. Carmichael ; Morchard—E. J. Kitto and C. Okeley ; Morgan—R. Wohling and H. Wohling ; Morphett Vale—T. Anderson ; Mount Bryan—J. Beckwith ; Mount Bryan East—W. H. Quinn, R. Thomas, and T. J. Quinn ; Mount Gambier—J. A. Engelbrecht, D. A. Collins, A. A. Sassanowsky, A. Dow, and C. T. Major ; Mount Pleasant—H. S. Giles ; Mount Remarkable—L. A. Bauer ; Mundoora—C. E. Dolling and J. A. Owens ; Nantawarra—W. Smith, G. N. Gosden, and J. Nicholls ; Naracoorte—E. Coe, S. H. Schinckel and A. Langeluddecke ; Narridy—J. Darley, J. J. Kelly, and P. Haren ; Northfield—H. Goldney and G. Kemp ; Orroroo—W. Robertson ; Parrakie—F. J. Dayman ; Paskeville—T. H. Price and C. L. Palm ; Penola—H. Ricketts, D. Adamson, and F. W. Robinson ; Pine Forest—J. Edwards and R. Barr, jun. ; Port Broughton—H. A. Dolling and T. E. Pattingale ; Port Elliot—H. B. Welch and J. Brown ; Port Germein—A. Carmichael and E. G. Blesing ; Port Pirie—H. G. Hawkins, W. R. Wright, and T. Johns ; Quorn—C. Patten, J. Brewster, and R. Thomson ; Redhill—W. Stone, J. Pilkington, and T. Cox ; Renmark—E. M. Taylor and F. Cole ; Rhine Villa—G. A. Payne and F. E. Hecker ; Saddleworth—P. Cornwell, R. G. Townsend and F. Coleman ; Shannon—W. L. Williams ; Sherlock—W. H. Wood, J. B. Coombe, H. Burnett, C. J. Osborn, and R. Trezona ; Smoky Bay—D. Barker ; Stockport—J. F. Godfree and D. G. Stribling ; Strathalbyn—J. W. Fisher and R. Watt ; Tatiara—C. Saxon and T. L. Truman ; Uraidla and Summertown—J. Rowe ; Utera Plains—R. Hornhardt and R. J. West ; Waikerie—W. J. Green and J. J. Jones ; Wepowie—C. Halliday and C. Pearce ; Whyte-Yarcowie—W. G. Lock, E. M. Jenkins, and E. J. Pearce ; Willunga—J. A. Hughes ; Wilmington—W. Slee and R. G. S. Payne ; Wirrabara—P. Curnow, H. Lawson, F. Passow, P. Lawson, and W. Stephens ; Woodside—W. Rollbusch and A. S. Hughes ; Yallunda—G. Provis ; Yongala Vale—T. H. Battersby and J. Chigwidden ; Yorketown—C. Domaschenz and R. Newbold.

Members of the Advisory Board present at the Congress :—J. W. Sandford (Chairman), A. M. Dawkins (vice-chairman), Col. Rowell, C.B., C. J. Valentine, J. Miller, G. R. Laffer, Professor Angus, Professor Perkins, and W. L. Summers (Secretary).

Opening Night, September 13th.

The Chairman of the Advisory Board of Agriculture, Mr. J. W. Sandford, occupied the chair, and called upon the Minister of Agriculture to formally declare the Congress open.

ADDRESS BY THE MINISTER.

The Minister of Agriculture (Hon. E. H. Coombe, M.P.), said :—“Mr. Chairman and gentlemen, I am pleased to see so many present. It is a good sign that on an occasion like this you can gather together such a crowd of representative men of agriculture from all parts of the State. (Hear, hear.)

I am pleased to have the opportunity of meeting members of the Advisory Board of Agriculture and delegates of the various country Branches at their annual conference. On behalf of the Government I wish to say that we appreciate the work of the members of the Advisory Board, whose special knowledge of the various departments of our rural industries entitles them to speak with authority. We also appreciate the practical and useful work of the various Agricultural Bureaus. (Hear, hear.) As wit sharpens wit, so knowledge stimulates the desire for further knowledge, and improvement in method begets a desire for greater improvement.

REMARKABLE ADVANCE.

"We have reason to be proud of the remarkable advance made in our agricultural method and production during the last 20 years. (Hear, hear.) Twenty years ago the average farmer looked upon the scientific man with a certain amount of suspicion. He regarded him as something in the way of a dreamer or a faddist. To-day there is genuine friendship between them. (Hear, hear.) The greater readiness of each to regard himself as the complement of the other is better for the whole development of our rural resources. The discovery of the process of making superphosphate, which occurred, I believe, in a German chemical laboratory, was a magnificent thing for the farmers of this State. The chemical laboratory should be regarded as a very valuable institution, and every farmer may do worse than doff his hat when he comes to such an establishment.

'SEND ALONG AS MANY AS YOU CAN SPARE.'

"By reason of his skill and ability the South Australian may be considered the champion of Australian agriculturists. (Cheers.) I recently visited New South Wales, and I was told by the Under Secretary of Agriculture that they would take as many South Australian farmers as we like to send. Said he : 'They are the best men we get. They set an example to our own farmers. Send along as many as you can spare.' I said, 'We can't spare any.' (Cheers.) I told him that we had parted with them very reluctantly. During the past two years over 3,000 men from South Australia have taken up Government land in New South Wales. The same story can be told of Victoria. South Australian farmers have made several of the districts—the Wimmera particularly. One big farmer said to me, 'South Australian farmers have made this district, and have made me. I used to think that the only way to get enough to carry on was to scratch in a large area. I used to put in 1,000 acres ; and then the South Australian farmer came along. He did not look very much, but he got as much from 100 acres as I got from my 1,000. I began to follow his example, till to-day I am wealthy.' That is evidence of the skill and energy which South Australian farmers possess. It matters not whether you travel by rail or over our wretched roads —"

A Delegate—" You have put your foot in it."

The Minister—"I dare say I know more about them than any of you. During the last few days I have been simply overwhelmed with deputations with the same story. That is another matter. What I want to say is that anywhere in the country you see evidence of the skill and ability on the part of South Australian farmers.

READS LIKE A ROMANCE.

"The history of our advance during the last 20 years reads something like a romance. It is simply marvellous. One cause of this great advance is the dissemination of knowledge and stimulation of ideas which have resulted from the Agricultural Bureau system. I cannot help remembering that during the past year we have had removed from us by death one who played a very important part in the establishment of this system. I refer to the late Mr. Molineux. (Hear, hear.) He, indeed, did pioneering work along the lines of scientific agriculture. He it was who more than anybody else laid the foundations of the Agricultural Bureau system which has been such a marvellous success. I must mention the name of another gentleman who did pioneering work, and that was the late Mr. Krichauff. It is well for us in these days of prosperity and harvesting to remember those who did the sowing. (Cheers.) I am sure that in the hearts of all there is a sense of reverence and gratitude to those who have done the pioneering work of our agriculture.

LOOKING TO THE FUTURE.

"While the past is very interesting it is not the past that has brought us here to-night. We live in the future, and it is the future that interests us most. While we have made such progress, it would not be wise to assume that we have reached the limit of progress. Nature is boundless in her gifts, and the reason we do not appropriate them is because we do not recognise them. So far as the use of superphosphates is concerned, if we had made the discovery a quarter of a century ago we would have enjoyed these times of prosperity earlier than we have. The greatest factor, after all, in progress is not Nature, but man—the power of man to realise the blessings which Nature has in store for us. It is that thought which underlies the work of the Agricultural Bureaus and the Department of Agriculture. The object is to ensure greater and greater efficiency in the human factor. America and Europe are our competitors, and success against those competitors depends not so much on the characteristics of soil or climate, but whether the human factor—the man behind the plough—is equal in skill and ability to the American and the European. Hence everything should be done to increase the efficiency of the man who is responsible for the development of his farm or garden.

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department shall be made more and more effective. The objects of the department are to help the producer to increase production, to decrease the cost of production, and to help producers to market to the best of their ability. The means by which this is done are investigation, education, experiment, and, in some cases, by the direct operation of the Government department.

OUTLOOK SATISFACTORY.

"It is gratifying that the outlook of the rural industries is so satisfactory. Take the pastoral industry. I am assured by Mr. Kidman that the prospect is very good. He tells me that the rental conditions of the pastoralists of South Australia are more favorable than those in any other State. He tells me, further, that the line to Oodnadatta is a very great convenience, and that there is no lease which he knows of could not be exchanged at a premium. We have as a State done a great deal for the pastoralist, and we have been glad to do it. We recognise it as a staple industry. We have spent a great deal of money in vermin-proof fencing. Or, take the wheat industry. It is simply astonishing to look at the figures which we can produce to-day compared with those of 10 years ago. I had the curiosity this afternoon to make a comparison, and it is as follows:—

1895-6	wheat average	4.20bush.
1896-7	"	1.66bush.
1897-8	"	2.64bush.
1898-9	"	4.91bush.

Now coming down 10 years later:—

1905-6	wheat average	11.46bush.
1906-7	"	10.19bush.
1907-8	"	10.91bush.
1908-9	"	11.45bush."

The Hon. R. Butler—"Those figures are certainly not overstated."

The Minister of Agriculture—"Undoubtedly not. The tendency has been to be within the mark and not over it. We cannot help remembering the prophecy to which Professor Lowrie gave utterance over 10 years ago, at a time when seven out of ten harvests had produced an average of less than 5bush. He said it would not be long before the average in South Australia would be between 10bush. and 12bush. to the acre. At that time that was a bold prophecy, but it has been splendidly justified by results. Another very satisfactory reflection to-day is the price of wheat. A few years ago the figures were down to 2s. 6d. a bushel, and farmers began to wonder whether they were going any lower, and what they would do next. To-day you cannot say that you cannot get anywhere within cooee of 3s. a bushel, and looking forward it is a bit hard to say how it can come down very much."

A Delegate—"Once I got 1s. 6d. a bushel."

The Minister of Agriculture—" Yet that gentleman still lives." (Laughter.)

The Delegate—" Yes, and I am 78 years of age."

The Minister of Agriculture—" He is one of the grand old sort. Men like that deserve to succeed, and deserve, when they are finishing life, to spend it in comparative comfort. (Cheers.)

AUSTRALIA ON VELVET.

" Only the other day a great American authority ventured the opinion that by 1915 America would consume her total production of wheat; that America would have nothing to send to the markets of Europe. If that be so, is it not a fact that the Australian wheatgrower stands on velvet? It seems to me that he has a very fine prospect opening up before him. The Department of Agriculture is doing its best to help the wheatgrower. It has, by experimenting at the Roseworthy Agricultural College and at Parafield and other places, endeavored to demonstrate which are the best kinds of wheat to grow, the best manures to use, and the best general practices to adopt. I think it will be admitted that good work has been done with these experiments. I am glad to see farmers of South Australia responding very willingly to any lead which might be given by this institution. This department has encouraged the use of selected wheats, wheats which will produce larger results; wheats which are a better quality and claim a greater price, and there is no doubt that if farmers follow that lead as they are doing to-day, their returns will be very much enhanced. I remember Professor Perkins told me a year or two ago, during a visit to the Agricultural College, that it was possible by selection in a few years to increase the production of wheat by 10 bush. to the acre, and I was very much struck by that remark. Then there is the question of increasing the flour strength of our wheat, and thus ensuring improved price again. We hope to be able to distribute wheats by and by, which will not only be prolific, but will possess high flour strength. I have been reading about some experiments at Cambridge University, and the results obtained by cross-bred wheats and other cereals have been remarkable. The professor in charge of the experiments calculated that in the course of two or three years he would be able to produce sufficient of these varieties to distribute and make a difference of from £1 to £2 per acre to the farmers of England. We hope our efforts will be as successful as those in England.

DRY-FARMING.

" Dry-farming, of course, is the practice of doing everything possible to conserve moisture. Some experiments have already been made in the State to a satisfactory degree. I am pretty optimistic: I am always looking at the bright side of things, and I am inclined to think that when this practice becomes generally known it will lead to the widening of our wheat area. (Cheers.) In America large areas have a rainfall of from 8in. to 12in., and

are cultivated by this system. Good crops have been produced, and I see no reason at present to think that we may not have equally good results over a large portion of South Australia. There may be a modification of the practice, and, judged by the successful results of the experiments up to date, the system is bound to be of some importance in this State. The Government intend to encourage these experiments, and if it is proved to be a meritorious system it will, of course, be widely adopted.

MARKETING OF WHEAT.

"The Government have paid some attention to the marketing of wheat. I daresay you have heard something of the proceedings of the Wheat Commission. I have. (Laughter.) I think the investigations of that Commission have shown very clearly that the farmer of South Australia is not receiving as much for his wheat as the farmer in Victoria and New South Wales. Of course, to some extent, that is due to the existence of a nice little fellowship or honorable understanding between the wheatbuyers. (Laughter, and hear, hear.) How far that sort of thing is justified I am not going to lay down to-night, but it may become dangerous for any body of merchants to control the market. (Cheers.) The merchants in South Australia are a good lot, but they are not angels. (Laughter.) They have just the same human nature as merchants in the other parts of the world, and I hear that merchants in other parts of the world who have controlled the markets have utilised them to their own advantage. (Cheers.) These combinations want to be watched very carefully. The Government is prepared to undertake experiments in shipping on farmers' account, and to conduct experiments with a view to finding out whether improvement can be made in the present system of marketing wheat.

DAIRYING INDUSTRY.

"I am satisfied that the dairying industry is capable of greater expansion than has been the case during the past few years. I do not know whether the cause has been that wheat-growing is much more profitable, but I daresay, that is the case; but we do not see the extension of the industry that we see in the other States. I rather think that is due to the fact that our producers are getting a living more easily by wheat-growing; but I hope the time will come when as well as our wheat farms we will have smaller holdings devoted to dairying, poultry farms, pig-raising, and smaller industries, because I believe there is room for them all in South Australia and that they would bring much wealth to the State. The Government, with a view to encouraging the dairying industry, have established a stud farm at Turretfield. We hope to bring about improvement in dairy stock as the result of experiments, and to disseminate knowledge which will be of value to dairymen. (Cheers.) I find that the South Australian stockowners are not going in for ensilage to the same extent as people in the other States are doing. We know there are

certain seasons in the year when the natural food is scarce, and it becomes necessary to have a supply of food such as ensilage to tide cattle over the dry times. The Government have before them a suggestion to assist in the erection of sample silos in various parts of the State, so that they may serve as an education to those round about. In Victoria the Government have for several years assisted those who wished to build silos by finding money for them and giving three or four years to return it. That suggestion is under the consideration of the South Australian Government, and it may possibly be adopted. (Cheers.)

Eggs.

" We have in Mr. Laurie an enthusiastic gentleman who has done splendid work for the poultry and egg industry. (Cheers.) We have in Major Norton a gentleman who has seconded his efforts very ably indeed, and in a very enthusiastic manner in the old country. Major Norton has considerable information to give regarding the export trade. That officer is entitled to great consideration when he speaks, and I hope the producers of South Australia will rally round him and give him a chance to prove that his ideas are correct. (Cheers.) I daresay you will all be greatly interested to hear what Major Norton has done in the old country. We have been at a great disadvantage in being so far from the European market. Major Norton has been on the spot. He knows what takes place, and he has found that sometimes our produce passes through half a dozen hands before it reaches the consumer. It has been part of his business to endeavor to secure for the farmer a greater return for his goods. (Hear, hear.) The Government are proud of the work Major Norton has done in that direction. But it has only just commenced. He is going back again very shortly to get the producers of South Australia possibly into closer touch with the people on the home markets. We are very hopeful that in the course of a few years we will be able to lessen the expense of marketing in the old country, and the producers of the State will get the benefit of that. (Cheers.)

PRODUCE DEPOT.

" The Produce Depot, which has been greatly extended recently, has done splendid work for the producers of South Australia. The work is appreciated not only by the producers, but by business men, who are glad to take advantage of it. (Cheers.)

REGISTRATION OF STALLIONS.

" I am glad to know that there is a desire to bring about an improvement in the various classes of stock. A deputation waited upon me some time ago from the Royal Agricultural Society with the request that steps should be taken to make it compulsory for stallions shown at the various agricultural shows to possess a certificate of soundness. I quite agreed with the request. It does not seem a right thing that Government money should be expended

in prizes for unsound horses. (Cheers.) The Government will, as far as possible, apply the new policy during the coming show season. Later on we may follow the example of Victoria and introduce a Bill dealing with the registration of all stallions."

A Delegate—"Do it at once."

The Minister of Agriculture—"We will think about that. Unfortunately there is a great loss taking place year by year in various classes of stock. I think Mr. Desmond said to-day that the losses in cattle alone in 1907 totalled £47,000, largely due to the disease known as 'dry bible.' There is more loss in horseflesh than there should be, and the Government have decided to strengthen the department so as to meet the greater demands, and for the purpose of carrying out the request of the Agricultural Society in regard to the examination of stallions.

APPOINTMENT OF VEGETABLE PATHOLOGIST.

"Unfortunately diseases like bitter pit, codlin moth, and other troubles with fruit and vegetables have caused considerable loss, and during the last fortnight Irish blight has crept into the State. Then we hear of takeall in wheat sometimes. Red rust, fortunately, seems to be forgotten, and I hope it will not be resurrected. Takeall causes a great deal of loss in some years. I think the time is ripe for the Government to appoint a vegetable pathologist, and the matter is under consideration. Hitherto South Australia has had to ask the vegetable pathologist of Victoria to do the work, but at the recent conference of Ministers of Agriculture we decided in regard to such diseases as bitter pit to try co-operation in the different States. (Cheers.)

A FAVORED COUNTRY.

"We are a favored country in South Australia. We claim to produce magnificent quality in practically all our products. Some of the finest fruit, wheat, and wool in the world are grown here. Our butter has taken first prizes in shows in England. What we need is continued intelligence, skill, and enterprise on the part of the man on the land, wise legislation, and an efficient commercial system to produce greater prosperity than we are enjoying at the present time. I hope the Congress will be a very successful one, and that each year will mark greater and greater advance on the part of the producers and of South Australia generally." (Cheers.)

THE CHAIRMAN'S ADDRESS.

The Chairman said :—"I offer my best congratulations to the large number of members of the various Branches who are with us to-night, for this is surely evidence that the work of the Bureau is appreciated, and is of benefit to all concerned. If additional proof is required, wherever new country is opened out your Advisory Board is at once approached with a view to establishing Branches, and during the past two years 18 additional Branches have been opened, making a total of 117 Branches up to the present. (Cheers.)

It is most gratifying to see the keen interest which has been taken throughout the year in the country Branches, and only in a few instances is it at all lagging. In such cases our energetic secretary, Mr. Summers, immediately apprises the Board, and efforts are at once made to stir these sluggish Branches into activity. On the other hand many of the Branches enter into debatable matters to such an extent that I hear they talk until the small hours of the morning. However, even this is of no avail unless we as men seriously grapple with the suggestions offered towards improvement and immediately apply them, or at least make such tests to satisfy ourselves that they are an advantage or otherwise.

" Owing to the severe drought conditions which we unfortunately experience at times, South Australian farmers have become more thrifty and vigorous than is the case perhaps in the neighboring States. (Hear, hear.) I trust that the lessons gained will not be lost during these seasons of prosperity, for I quite feel that the farmers have been for some years on a good wicket. The present season promises to be even more propitious than any of its predecessors, and I am sure you will all join in the wish that this will be fully realised. Good, however, as the seasons are we must not forget that so sure as droughts have visited us in the past, so sure will they come again; and those on the land who have taken advantage of the good times to make the best arrangements to combat drier seasons will be the ones who will succeed.

TWENTY-FIRST MAJORITY.

" I also congratulate your Bureau in this being its twenty-first Conference. It cannot now be described as being a mere stripling, for to-night it has blossomed out into full manhood; and it is to be hoped that the keen interest which has ever been taken in matters will continue for all time. Indeed, South Australia is to be envied in this great Bureau organisation and the advantages it offers to those on the land, and I understand that some of the other States would like to establish Agricultural Bureaus on similar lines to those which exist here. We, therefore, in this institution have something to be proud of. During the year the attendance at the Advisory Board meetings has been very satisfactory, and all matters submitted received careful attention and were forwarded on to the heads of departments with suggestions, which I am pleased to say have invariably been adopted.

FERTILISERS ACT.

" This has been in operation for a considerable period, and we must all recognise that it is a necessary measure, and has long ago proved its advantages.

SALE OF CHAFF.

" Recommendations were tendered to the department regarding the necessary methods for the better conduct of this trade, and many of the chaff merchants have welcomed the Act, whilst buyers of fodder can now purchase their horse feed true to description.

COUNTRY CONFERENCES.

"One was held at Mount Gambier, and the Board attended it. It was very gratifying to see the numbers who were present, and to hear the healthy discussions which took place, and I am sure good will result. One proposal—which we look upon as very sound—was that an expert be permanently appointed to the South-East District. We want a man who would have a thorough understanding of soils, in view of the exceptionally variable nature of the land in that part of the State. The Board therefore recommended to the Minister that something should be done, and I understand that Professor Angus, who has charge of Kybybolite, is giving the South-East special consideration in the direction mentioned. Indeed, in a country where the agricultural area is of such a great magnitude, and conditions necessarily vary, I feel sure it would pay to appoint a specialist in each of the several districts. (Cheers.)

ALBERT MOLINEUX.

"I am sure we all regret the loss through death of one of our members, the late Albert Molineux, who was the father of the Bureau. (Cheers.) Practically his whole life was spent in endeavoring to advise and bring about a betterment in every direction possible to farmers. He missed only one of our 20 conferences, and that was 12 months ago, through illness. As a mark of the high esteem in which he was held, a fund has been organised with a view to establishing some lasting memorial of his name in the shape of an Agricultural Scholarship at Roseworthy, and no doubt it will receive all the support it merits from your hands. I would like to hear of a ready response from not only all present to-night, but from everyone on the land.

DAIRYING.

"This is a branch of the farm which has well recouped the thrifty individual for his labor, and indeed, often through dry times farmers have been able to get through the drought struggles by the returns from the dairy, and with fodders plentiful now there should be a big increase in the output this season. I am pleased to say that the markets are opening out favorably, and are unlimited in their requirements. (Cheers.)

ENSILAGE.

"This, also, is a feature of the farm that I am afraid has received little attention in years gone by, for how often have we read of the dairyman losing his herds during drought seasons? I firmly believe the remedy is in their own hands. Does it not seem a pity in a season like the present, with feed in such abundance, that there must be thousands of tons of it which will not be consumed—owing to the neglect of not putting it away in the form of ensilage? (Cheers.) The Advisory Board has this matter under consideration, and is suggesting to the Minister the advisability of appointing experts to visit the districts, and instruct the farmers how best to prepare

the ensilage. I feel sure that once the advantages are recognised no thrifty dairyman will neglect this very important question. (Cheers.) I feel that these gatherings of farmers will result in good, through farmers being able to exchange experiences and discuss latest ideas. I hope also that you will put the suggestions offered into practical test. This is necessary to determine their benefits, and at the same time by so doing you are encouraging the spirit of self-reliance, which is always associated with farming. I congratulate the farmers on the excellent outlook of the season, and only trust that the promising prospects of a successful harvest will be realised in every way." (Cheers.)

VOTES OF THANKS.

On the motion of Mr. H. A. Giles (Mount Pleasant), seconded by Mr. J. Malcolm (Kadina), a hearty vote of thanks was passed to the Minister of Agriculture for his address.

The Minister said—"I hope that in a few years we may have 3,000,000 acres settled in South Australia, and that instead of having a population of 410,000 it will be 500,000, and then go on until we have 1,000,000. I wish to move a hearty vote of thanks to Mr. Sandford, for having carried out the duties of Chairman."

The Hon. R. Butler seconded the motion, which was carried.

Tuesday, September 14th, 10 a.m.

Mr. J. Miller occupied the chair. There was a large attendance of delegates and other gentlemen.

PROVISION OF FOOD FOR AUTUMN AND WINTER.

Mr. Mark Weston read a paper on this subject, written by Mr. A. H. Forder (Crystal Brook Branch).

"The greatest problem stockowners have to solve is the provision of food to keep their stock in good condition through the autumn and winter months. The best of the dry grass and stubble has gone by the end of February, and stock begin to fall off in condition and need something more than they can pick up in the paddock. If farmers could get a large and cheap supply of food for this time of the year stock-raising would become more profitable. There are two ways of providing this supply. First by growing early feed; second by preserving the previous season's crop. I would suggest that a farmer who goes in for lamb-raising should in March sow about 50 acres of what is to be his grass paddock with Cape oats or rye, putting on about 50lbs of super. per acre. All grass, wild oats, &c., will come up with the seed that is sown after the first rain, and will soon make good feed. I

prefer rye to oats, because it grows faster and stools out better. Growing green feed is not all that is needed, because we cannot depend on having early rains. It is necessary to preserve some of the previous season's crop, and I prefer ensilage to hay. An acre of crop that would go 2 tons of hay to the acre would yield 10 tons of green stuff, and that made into ensilage would be the same weight when ready for use, as nothing is lost while in the pit. Anything that will produce a thick crop will do to grow, such as wheat and Cape oats mixed, wild oats, barley grass, &c., for ensilage, or a patch of crop that is dirty with mustard will come in very well. The crop should be cut when it is in full bloom and put into the pit as soon as possible after cutting up, only cutting as much of the crop each morning as can be carted and chaffed into the silo that day. This must be well tramped into the silo, and when full it should be left a couple of days to sink, then it can be filled up again and left to sink again; after filling the third time it should be covered over with old bags and about 6in. of dirt thrown on the bags. The ensilage will be ready for use in three months. For a pit I would suggest building one of stone 6ft. underground and 6ft. above ground and 12ft. square, with a door above ground for getting the ensilage out. This sized pit would be large enough for the average farmer, as it would hold about 64 tons. The pit should be handy to the chaffcutter, so that the stuff can be run up with an elevator, and a great deal of handling be saved. Cattle will thrive on 25lbs. of ensilage per day, and 10 head of cows can be kept for six months on the produce of two acres, with the aid of the feed that can be picked up in the paddocks. Ensilage does not taint the milk or butter, but on the contrary, tends to improve it. Sheep do well on 4lbs. of ensilage per day; 280 ewes will eat half a ton a day, and the produce of six acres will keep them for four months. The method of feeding them is very simple. The ensilage is put into wooden troughs, which are placed in a small paddock and the sheep are brought in every morning and fed. Sheep that are so fed do not fall off in condition, and are always ready for sale as fats as soon as wanted. Ewes can be depended on to rear early lambs, as they will always have plenty of milk. Ensilage will keep for a number of years, and can always be relied upon as a food supply if put in carefully."

Mr. J. Malcolm (Kadina)—“The paper has emphasized strongly and wisely the remarks made by the Minister last night in reference to ensilage. I am glad to notice the interest being taken in the Congress work by the young farmers. (Cheers.) It speaks well for the future of South Australia that the scientific aspects of the work are engaging their attention. It seems almost incredible that 10 tons of ensilage can be made from the material required to make two tons of hay; but I hope it is the case. I would like to know if weeds put into silo have a wholesome effect or otherwise on the milk. I wish to throw out a suggestion. On many farms, prior to the reticulation of the Beetaloo and Bundaleer water scheme, there were dams which probably

have been allowed to get into disrepair, and it will be a splendid opportunity to turn them into silo pits. The paper is a useful one, and is deserving of serious consideration." (Hear, hear.)

Mr. A. S. Hughes (Woodside)—"I have been making ensilage for 15 or 20 years. Many people stopped making ensilage because they were led to believe that they could make it with very little or no weight. The consequence was that when they made any stacks they lost more than half of it. It turned out like mouldy hay. The advice we got was to let the crop lie a little while. My advice is to gather the crop and to put your weight on the stuff at once. Once you allow the temperature to go over 100° it takes a considerable weight to get the heat out. The temperature might go up to 150°, and then you would not get sufficient weight to eliminate the heat. The consequence is it is all burnt up, and you will find that the ensilage has gone a black-brown color. In that state it will scour the cows. The proper color is a nice brown—a little on the yellow side. Six inches of earth is nothing like sufficient weight. My experience is that you want something in the crop with a certain amount of juice. If there is an undergrowth of dandelion or some other succulent stuff, all right; but to make the best ensilage you want peas or clovers with wheat or oats. Once the people get into the way of making good ensilage it will be a great success. The recommendation has been made of keeping the outside of a stack firm and high. If the inside has a tendency to be a little soft, it settles more in the middle, and the ends of the stuff turn up, with the result that the air penetrates further. The greatest difficulty farmers have in making ensilage is in weighing it properly. A good method is to have several shallow tanks of water on the top of the ensilage when the pits are filled. The men of these days, however, are not too fond of work, and the less they have to do the better. (Laughter.) They seem to regard it as a waste of time to be continually lifting weights off the pits." (Hear, hear, and laughter.)

Mr. J. Hillier (Balaklava)—"The people in our district have the ensilage pits about level with the ground, which saves a good deal of trouble in the matter of weights. One gentleman used an old dam, rounding the corners off, and it has served the purpose excellently. He fed his cows right through the dry season on ensilage, and always got 1d. a pound more for his butter than anybody else. Pigs have also been fed on it, and have done well."

Mr. J. A. Engelbrecht (Mount Gambier)—"I was pleased last night to hear the Minister mention that the Government had under consideration the Victorian idea of building silos for farmers on the deferred payment system. It would mean that a large number would go in for them. Without doubt, they would turn out to be a success. In America they have a simple device for weighting. They run wires across, and have two or three strainers, so that the slack may be taken in as the stack settles down. In the South-East they are paying great attention to the conservation of fodder. I had a strip of land, and I

bought 6lbs. of maize and planted it. From that I have been able to give a little green stuff each day during the dry weather to seven cows for 13 weeks. That has been done without irrigation or anything else. With the aid of a sprinkler, a neighbor had 13cwt.s. of lucerne a year, and I believe this represented a growth of 12ft. to 13ft. I wish to refer to a couple of fodder plants which have been a great success in Victoria and New Zealand. One is 'choumouellier.' It grows to a height of 7ft. or 8ft., and when the stem is fully ripe it contains a marrow, something like maize. Then there is giant kangaroo rape, which grows to a height of 10ft. It has proved a splendid fodder for horses."

Professor Perkins—"The paper has given me a great deal of pleasure. A point has been raised as to whether two tons of hay are equivalent to 10 tons of green stuff. For the last four years I have always kept a few sheaves out when dealing with the ensilage crop. I take 50, weigh them, let them dry, and weigh a second time. The loss of moisture I found to be as follows :—1906, loss of moisture on green stuff, 69·5 per cent.; 1907, 70·5 per cent.; 1908, 66·8 per cent. That is roughly about two-thirds. A crop of green feed of 7 tons 12cwt.s. 44lbs. worked down to 2 tons 10cwt.s. 89lbs. of hay. So far as I can see, the result of three years' loss of moisture in green feed is equivalent to about two-thirds of the original weight. Probably Mr. Forder has over-estimated the amount of moisture contained in green stuff, unless he was dealing with more succulent ensilage than wheat. The ensilage we deal with consists of cereals mixed with vetches."

A Delegate—"Clover would shrink more."

Professor Perkins—"Certainly. There is bound to be loss in making ensilage, however careful you might be. When it is made to the best advantage in pits the loss will be about 10 per cent. If you put 100 tons of green feed in, and turn it out under the best conditions, it would be about 90 tons. I know some people reckon the loss at 5 per cent., but we have never secured that. I do not think stack-building, except in cases of urgency, at all economical, because the extra cost on the other method would pay itself in the course of a few years. Our pits are about 15ft. deep and about 10ft. square, perhaps more. In these pits we put in about 40 to 45 tons. If we cram them to the top the ensilage is bound to sink a great deal. I have an idea that if ensilage pits were made with slightly sloping sides, so that the top would be about 6in. wider than the bottom, good results would follow. Ensilage shrinks, and with this method, as it shrank it would settle like a wedge, and you would not have any losses on the sides. Mr. Hughes referred to cereals not having enough juice to bring about fermentation. If you chaff it there is quite enough to ferment, even if it is slightly over ripe and the leaves are going yellow. I have an idea that the notion about making ensilage without waste comes from America. Possibly there the climate helps them. In reference to the difficulty of weighting, I advise that instead of

having one huge ensilage pit, to have several smaller ones, so that they can be filled up and attended to progressively. We do that at the College. We have done so during the last four years, and no losses have occurred—except a little on the top sometimes. I find that the easiest weights to handle are fencing posts and strainers. I once tried dry rubble, but I will never try it again. Ensilage is very simply made, and there is no secret in its manufacture. My advice is never to cut more than you can chaff in the same half-day. It is no use attempting to cut enough to last to-day and the day after. I use a certain amount of salt, but I have not been able to make sheep take to the ensilage. You have practically got to starve them on to it. Sheep are difficult animals on which to force a new kind of food. Mangolds is a crop that is very much neglected, but I advise farmers to pay more attention to it. In reference to the fodders mentioned by Mr. Engelbrecht, it would be the biggest mistake in the world to try and make ensilage with 'choumouelier.' It decays like cabbages. It is, no doubt, a splendid fodder plant in this country, and it would do well in districts like Mount Gambier and south of Adelaide, with a sure rainfall, but I prefer thousand-headed kale any day. There is no doubt that giant rape will be a splendid fodder plant in districts where it can grow in the summer months. We prefer the winter rape. At Roseworthy we sometimes found that a certain amount of water used to drain at the bottom of the pits, and we adopted the practice of laying a big layer of straw there—even as much as 3ft. We have found live stock eat the straw readily when it is removed from the pit."

Mr. Summers—"I wish to read an extract from an article by Dr. Cherry in the Victorian *Journal of Agriculture*. He quotes the example of Messrs. Thain Bros., at Carapooee."

Last November, they filled their silos with a crop of oats grown on 15 acres. They have been feeding it during March, April, May, and June to 600 large-framed merino ewes and well-grown weaners. The amount consumed by each sheep averages between 1lb. to 1½lb. per day, the usual daily ration varying from 800lbs. to 900lbs. The silage is fed in wooden troughs made of three 6in. x 1in. flooring boards. These are shifted every few days on to a clean piece of land. Every particle of silage is eaten by the sheep. The troughs are cleaned out as thoroughly as if they had been brushed by hand, and there is no waste silage lying on the ground close to them. A fortnight ago, at the time of my visit, the sheep were feeding in a stubble paddock, and, as you know, this season every stubble paddock has a fairly luxuriant growth of wild oats and self-sown coming on. Messrs. Thain Brothers' paddock was certainly well above the average in this respect. Yet, the moment the sheep saw the cart enter the gate, they instantly headed for the troughs.

Now, consider what this means. A 15-acre crop produces enough fodder to keep 600 ewes and weaners in good condition for three months. This is equivalent to 150 sheep for 12 months, or in other words, by means of cultivation this paddock is made to carry the equivalent of 10 sheep to the acre the whole year round. The three months in which they are hand fed is the critical time of the year. Succulent feed during March, April, and May insures the success of the coming lamb and means that its mother will have a good supply of milk. Lambs reared under these conditions are just the ones which can be sold with profit for the export trade six months later on. Such a result cannot be obtained by dry feeding alone. The cost of harvesting the crop, chaffing it into the silo and feeding it to the sheep, including binder twine, is less than 3s. 6d. per ton. What other system can produce equal results, and this in a district where the annual rainfall is only 18in. ?

Mr. Pearse (Whyte-Yarcowie)—“I would like to know about the value of white mustard. It grows readily in the North. What is its value for feed purposes?”

Professor Perkins—“It is useless for ensilage. It is a splendid food for sheep, and I have fed it frequently. They take well to it after a while. You cannot feed cattle, as it taints the milk.”

Mr. Smith (Angaston)—“What proportion of salt per ton does Professor Perkins use?”

Professor Perkins—“I do not know exactly; but it is a comparatively small amount. You just sprinkle it over the layers. Peas mixed with oats or barley would serve to improve ensilage. In reference to growing peas with barley, while the peas may germinate well and get a good start, when you come to collect them you will wonder where all the peas have gone to. The barley smothers them out, but oats are not affected to the same extent.”

Mr. Engelbrecht (Mount Gambier)—“In reference to giant rape, the seed was developed by Mr. Campbell, of Victoria, from dwarf Essex, which is now in the market. I strongly recommend it. Mr. Campbell told me that for many years he had such numerous inquiries that he gave seeds to merchants to distribute. It is planted in the spring. It not only ensures summer food, but it will not die away until the following spring.”

Mr. Castine (Kangaroo Island)—“I would like to know the best method of ascertaining the true temperature in silos.”

Professor Perkins—“It is not an easy matter to ascertain it, and I think Mr. Hughes will agree with me that it is unnecessary to bother about this detail. We let a pipe down through the ensilage and then drop a thermometer into it. That method made a hole in the ensilage, and the admission of air did not improve it.”

Mr. A. S. Hughes (Woodside)—“I agree with Professor Perkins. I tried the idea of dropping a thermometer into a pipe, but it is best after all to keep weight on.”

Mr. Weston—“I desire to thank members for the splendid discussion following Mr. Forder’s paper. He wrote the paper from his own practical experience. I know that if ever we want fat sheep at Crystal Brook we can always find them on Mr. Forder’s farm. The condition of his stock is the best advertisement for the policy he advocates in his paper. I do not think Mr. Forder ever tried skinless barley. He sticks to rye or early greenfeed. I wish to say that if the farmers would undertake to provide a silo in our district the Government would send a man to superintend the making of ensilage.”

VETERINARY EXAMINATION OF STALLIONS.

Sir Lancelot Stirling, M.L.C., introduced a discussion on the veterinary examination of stallions. He said:—“Undue restriction of individual liberty of action is generally resisted by right-thinking persons, and well so;

but it would be ill for the community if in some respects restraints were not imposed in the interests of those who otherwise would fall a prey to the wiles of the unscrupulous. The day has passed when we hear adverse criticisms of attempts by Governments to secure by rule and regulation pure food and drink for the consumer, much as the vendor of these adulterated goods may resist the restriction of his liberty of action in his own interests. The question involved in the matter on which these remarks are intended to initiate discussion makes one ask whether the owner of an unsound stallion offered for the use of the public for a consideration does not come within the category of a purveyor of unsound goods, and as such should by some means be restrained in his liberty of individual action, in that, either wittingly or otherwise, he offers a menace to the industry of horse-breeding. I am aware that in some quarters the suggestion of any restriction is regarded as an unwarranted interference on the part of so-called cranks, among whom, possibly, I run the risk of being classed. May it not be that such criticism comes chiefly from those owners whose industry is interfered with, and that the cranks in pursuit of their fads are actuated by a laudable desire to maintain a valuable industry and protect the users of the services of public stallions, who, after all, form the great unprotected majority, and are therefore worthy of consideration. Horse dealers and, in a minor degree, horse breeders and owners have, rightly or wrongly, earned the reputation of being able to look after themselves; and it may be to the interest of farmers and others if a helping hand is held out to them in keeping their end up in a deal. I need not burden my remarks with any lengthy comments on the value of the horse industry and its only half-developed possibilities to Australia. Every farmer, by his own experience in buying and selling, has learned that now-a-days the purchase of the necessary horseflesh is a heavy drain on his bank account, and his sales a welcome addition to his profits. That a mob of horses from the north should be able to produce the healthy average of £36 per head speaks well for the demand as well as for the character of the article submitted. This character we all desire to see maintained unimpaired by the injury which the spread of unsound stallions would undoubtedly produce. Although we all fancy our ability in appraising the qualities of a horse, I may, I hope, without hurting their feelings, couple most farmers with myself in the confession that we may very easily be deceived in detecting the signs of many forms of unsoundness, hereditary or otherwise, in horses which we inspect. This is borne out by the very usual practice of calling in veterinary advice when doing a deal. Why should this advice not be afforded to the stallion-using public in some general way, without individual cost to the user? The time is not far off when the more drastic method of licensing stallions and imposing penalties on the use of unsound ones will become one of the restrictions to which the law will compel us to submit. May it not be well to accustom ourselves to some degree of restraint by accepting a mitigated

scheme which, while allowing the liberty to use a stallion which has not been awarded a certificate of soundness should the individual prefer to do so, still affords to the unwary the facilities of discriminating between the sound and the unsound. Victoria, the source from which many of our changes of blood in horseflesh is obtained, is marching towards the more drastic scheme of licence; but in the meanwhile is satisfactorily working under a system similar to that which our Government has pledged itself to support the Royal Agricultural Society in bringing into force. That system is the forcing of agricultural societies to award prizes only to stallions which have passed veterinary examination and received a certificate of freedom from certain hereditary diseases, under a penalty of forfeiting its Government monetary help. There is no compulsion as to examination if the owner prefers to abstain from the show ring; but I venture to think that the system will soon demonstrate to farmers the advisability of seeking the services of a sire that has this advantage of soundness in the eyes of the experts who should know more than he does upon these points. The system affords him this chance. A brief synopsis of the proposed system is as follows:—

1. That all agricultural societies receiving Government subsidies shall insist on certificates of soundness in the case of stallions three years old and over.
2. That stallion inspection parades shall be held for the purposes of examination.
3. That for this purpose districts shall be appointed by the Government. The agricultural societies in such districts shall appoint delegates to arrange such parades. A Government veterinary surgeon will attend.
4. That refusal to grant certificates of soundness shall only be in respect of whistling, roaring, cataract, ringbone, sidebone, and unsound feet. Defects the result of accident, external injury, and overstrain or work not to disqualify.
5. That particulars of horse, name, pedigree, age, &c., shall be furnished on inspection.
6. Certificates to be issued within seven days after holding parades.
7. That the results of examination may be communicated to owner on application in writing.
8. That all agricultural societies shall make it a condition of entries that a refusal of a certificate shall not constitute a legal claim against the society or veterinary surgeon.
9. Certificates to be issued in respect of stallions three years or over. Stallions to be re-examined each year until five years old, when it will hold for life.
10. That the Commissioner of Crown Lands may cause any horse to be re-examined and withdraw certificate if cause therefor.
11. That any dissatisfied owner may appeal to the Minister. Appeal to be in writing and with a fee of £5 5s., also undertaking to pay rail and hotel expenses of Court. Appeal to be accompanied by a certificate from a veterinary surgeon that the horse is free from diseases mentioned. Appeal Court to consist of Government veterinary surgeon and two practising veterinary surgeons, and its decision to be final. No stallion refused a certificate to be submitted for re-examination except on appeal as provided.

"It will be asked—is some such inspection necessary, and is the condition of our horse-breeding industry such as to warrant its introduction? Unfortunately owners of mares generally show a predilection for the choice of a stallion standing at a low fee. Such a horse would naturally be the one which in the sale ring has been obtained cheaply, on account of some defect not transparent to the unskilled buyer; more likely a defect of an hereditary character prone to be transmitted in turn to his stock. I have seen it stated that out of 12 draught stallions imported from England eight were found tainted with hereditary defect. Since a system of examination has been in

force in Victoria it is stated that this State is being made the dumping-ground for horses from that State which have failed to pass in soundness, and which will undoubtedly leave their defects stamped upon the stock of South Australia. It behoves us, by following the example of Victoria, to make these importations as undesirable as possible. I am informed also that one draught stallion imported here from England has also visibly stamped his faults on the stock which have found their way into the sale ring, and there been sold to unsuspecting buyers. The initiation of the system will impose a responsible task on the veterinary staff of the State, and will demand skill in the performance of their duties to ensure satisfaction with their verdicts. The staff will have to be materially strengthened, but with the importance of maintaining the health of our stock, and the ensuring of proper investigations of diseases which seem to find such a responsive home in our sunny climate, it is one of the first duties of the Government to see that its staff is efficient and reliable. The great progress which has been made in older countries in veterinary science makes one ask if it would not be to the advantage of our stockowners, and through them to the State, to introduce extra officers fresh from the fields of discovery of the veterinary schools of the old country? I have for many years been a breeder of horseflesh, and experience has taught me how difficult it is to maintain the standard of excellence required by the buying public. Far be it from me to place further difficulties in the way of my fellow breeders, but no quicker curse can fall on a stud than the introduction of a tainted strain, and the consequent loss it entails. Be the system what it may, if it is in any way effective in keeping such stallions from use in our State it should be welcomed rather than resisted by those in any way interested in the horseflesh of South Australia. I am pleased that the Government see eye to eye with the Royal Agricultural Society in this matter, and I thank them for the ready response they have made to my suggestions to curtail as far as possible the introduction and use of tainted blood among our stock. Repeated efforts have been made through the Royal Agricultural Society to induce country Agricultural Societies to insist upon a mede of soundness from certain diseases in its prize winners. These have been frustrated often by the influence of stallion owners, as well as from a craven fear on the part of the management that the entries will be restricted. The first and chief efforts of our Agricultural Societies should be to place before the public what is best, even if that best is limited in quantities. Their prizes should be the hall mark of merit. To effect this desirable end the compulsion of the Government is to be very rightly applied."

Mr. C. Patten (Quorn)—“I do not consider that any horse should travel unless licensed or passed by a veterinary surgeon.”

Mr. J. Malcolm (Kadina)—“It is time steps were taken to preserve the horse-breeding industry of South Australia. In the Northern Territory there is unbounded scope for the extension of the industry. I move—‘That this

Congress approves of the recommendations contained in the speech made by Sir Lancelot Stirling, and that the Government be urged to adopt them.”

Mr. Dunstan (Mount Bryan)—“I second the motion.”

Mr. McCormack (Bute)—“Would it not be wise to give a veterinary surgeon power to condemn stock of bad make, shape, or form? The tendency is to engage such stallions because of the cheap fee.”

Sir Lancelot Stirling—“It is wise to proceed progressively. I do not think farmers would choose weedy stock. They are not so blind to their interests and commonsense. We want to save them from what they do not see and do not know. If the farmers select ill-shaped beasts with their eyes open, because fees are cheap, then God help them. That is their business.” (Hear, hear, and laughter.)

Mr. Smith (Angaston)—“I do not think that stallions should be kept for longer than three years in one district. I have known cases where they have been kept for five or six years, and I think such a thing is the cause of the deterioration in the local stock.”

Mr. Uphill (Balaklava)—“Our Branch of the Bureau has discussed the subject frequently. The action of the Victorian Government in dealing with stallions has been fully justified by figures. Out of 253 horses rejected only one appeal was made, although the deposit required on appeal is only £5. Of one family of 12 sires 11 were condemned without any appeal against the decision. In another case eight out of 10 were condemned by the experts.”

Mr. Weston (Crystal Brook)—“Would the Government send veterinary surgeons to any particular centres?”

Sir Lancelot Stirling—“The Government have undertaken to provide veterinary surgeons for the examinations. Parades will be held at convenient times, and it will be necessary for the officials to fix the times and places.”

Mr. Sexton (Bordertown)—“I went to one parade in Kaniva, Victoria. It was an object lesson. One of the officers told me that nothing but the best results would accrue from the certification of stallions. He said South Australia would be made the dumping-ground for their unsound stock.”

The motion was carried unanimously.

Sir Lancelot Stirling—“I thank you for your kindly response. It is not often when you start a reform that you get so many with you.”

NECESSITY FOR VETERINARY EXAMINATION.

Mr. C. F. Jarman (Clare) read the following paper:—“The Clare Branch would like the question of the appointment of veterinary surgeons by the Government discussed at this Congress. During the past year, especially, this subject seems to have sprung up continually. I take it that this is owing to the fact that stock-owners are more than ever realising the want of veterinary knowledge among themselves, and the immense loss of valuable

stock which might be prevented if there were more qualified veterinary surgeons among them. This is an age of specialists, and although I hold the farmer ought, as far as possible, to make himself acquainted with the common ailments of stock, there is no doubt there never was a time when there was so much need for the specialist who has made veterinary science his special study. Hence we find the Branches of the Bureau all over the State asking for the periodical visits of our Government experts, or, further still, their permanent residence in their districts. I have taken a little trouble to look up these requests, and this is what I have found.

"The Carrieton Branch would like other Branches to express an opinion as to the necessity for a competent veterinary surgeon being stationed in the North. Members were of opinion that a veterinary surgeon in a convenient centre in the North would be of great value to farmers, as many valuable animals were lost every year, often for want of proper treatment.

"The Koppio Branch was of opinion that a veterinary surgeon should be appointed by the Government and work separate districts of the State.

"The Penola Branch meeting, held June 12th. It was resolved to ask the Mount Gambier Branch to co-operate with this Branch in taking steps to secure periodical visits being paid to this district by a Government veterinary surgeon, to inquire into the diseases of and attend to the sick stock.

"At the Conference of Northern Branches, held at Caltowie on January 17th, Mr. J. H. Botterall suggested the appointment of a Government veterinary for northern districts. Mr. T. Dunsford moved that the Advisory Board be requested to ask the Government to consider the appointment of such an officer. He thought the companies in which stock was insured would probably be willing to provide part of the officer's salary. Mr. McAuley said the question was of urgent importance, in view of the great mortality among valuable horses. Veterinary Surgeon Desmond said that in South Australia there were four duly qualified veterinary surgeons, and in Victoria there were 115. The motion was carried.

"The Lyndoch Branch recently submitted a resolution that a veterinary surgeon should be stationed at the Agricultural College at Roseworthy, in order that his services might be available to the farmers in the district, where at present no veterinary could be obtained in cases of need. Professor Perkins and Mr. A. M. Dawkins both thought the idea a good one, and gave it their support. The members of the Advisory Board of Agriculture carried a sympathetic resolution unanimously.

"These expressions by the various Branches go to show that the subject under notice is a very pressing one, and that a feeling is abroad that the Government should do something towards helping the farmers in the direction indicated. I am sure that no farmer here wishes to ask for anything for which he is not prepared to pay, but I do say, and I am confident the majority will agree, that it would be a wise step for the Government to place the services

of qualified men within the reach of stock-owners who require and are willing to pay for their services. Often we have the mortification of seeing a valuable animal sicken and die because there is not a veterinary surgeon within reasonable distance. The Clare Branch of the Agricultural Bureau has been trying for years to obtain a lecture on veterinary science by the officers of the department, but have always met with the same reply—‘ Too busy,’ ‘ I am booked to visit other Branches,’ &c. Of course, we know one man cannot be everywhere, and the result is we are still waiting our turn. I am sure delegates from other Branches will agree that their experience has been similar to ours. I think what I have said surely demonstrates the fact that more veterinary surgeons are wanted in South Australia. I should like to hear the views of this Congress on the following suggestions :—

“ 1. That the Government appoint at least six, or more, veterinary surgeons for the State at a fixed salary.

“ 2. That the State be divided into districts, and an officer appointed for each.

“ 3. That the officer reside in the district to which he is appointed, and be available to stock owners throughout the year.

“ 4. That a schedule of charges be drawn up by the Government to be paid by stock owners for services rendered.

“ If this were done, I feel sure the fees charged would more than pay the officers’ salaries. Infectious diseases would be more easily located and stamped out, and a lot of valuable stock thus saved annually. Should Congress approve of this being done I would move—‘ That it be a resolution from this Congress to the Advisory Board of Agriculture asking that the Board will do all in its power to give effect to the proposals herein stated.’ ”

Professor Perkins—“ I support the recommendations in the paper, but the question of fees should be withdrawn. I do not think it necessary to make any charges. I suggest that one officer should be located at the Roseworthy College, which would be a convenient centre. We have equipment for a man to keep himself qualified in his profession.”

Mr. Pearce (Arden Vale)—“ I second the motion, if the fourth recommendation be omitted. Qualified officers should be at the disposal of stock owners.”

Mr. Jarman—“ My idea was that there would be no hope of getting this idea adopted unless the Government saw some way to secure payment. The farmers do not want anything they are not prepared to pay for. We want to be sure that when we send for a man he will be available. We cannot get a man from Adelaide, although we have tried frequently.”

Mr. Malcolm (Kadina)—“ I support the idea that fees should not be charged. Farmers are not the only people who have stock, and even some farmers are not too well off. The imposition of fees may mean hardship. We have anthrax on the Peninsula. It means that where the disease spreads the

places will be quarantined. If we are going to make poor people pay before they can get a veterinary surgeon, then what is going to be the result? The disease is going to spread. By all means let us be on an equality in this respect. In any case, the salaries come out of the general taxpayer. We are prepared to be taxed for the good of the community."

Mr. Cooper (Cummins)—"I support the resolutions, with the exception of that about fees."

Mr. McCormack (Bute)—"If the veterinary surgeons are to be free, they will be at the beck and call of everybody in the country. In the case of anthrax, a fee would not be expected."

A Delegate—"The farmers pay the greater part of the taxation of the State. It would be better if veterinaries were appointed by the Government, and were under Government control entirely. I disagree that one veterinary surgeon should be located at Roseworthy College. Adelaide will be near enough for those people."

The Chairman—"I will put the recommendations contained in Mr. Jarman's paper separately."

The first three recommendations were carried, and it was decided to urge that the services of veterinary surgeons should be free to stockowners.

The Chairman—"As the Agricultural College is for the instruction of our coming farmers, I certainly think a veterinary surgeon should be stationed there, and I will do all in my power to secure that result." (Hear, hear.)

Tuesday, September 14th, 2·15 p.m.

DRIFTING OF SANDY LANDS.

The following paper was read by Mr. W. R. Wright (Port Pirie Branch) :—

"Although this is a most important subject it has been very little discussed by the various Bureau Branches, no doubt because it affects only a portion of our State, and because until within a few years ago the area of sand-drift country was not so large or nearly so bad as it is at present. In the southern districts of our State as well as in the north the area of sand-drift country is assuming such large proportions that the landholders are beginning to realise that some effectual method of combating the drift is necessary. During the last few years new land has been thrown open for closer settlement, much of which is of a sandy nature, and in all probability will, after a few years of cultivation, be inclined to drift.

"In the drier districts, where the conservation of moisture is such an important factor, it is necessary to fallow the land and work it well to produce a profitable return, and on sandy land, where it is worked down to a fine state, there is a tendency to increase the drift. A method of combating

sand drift which has been practised in our district for several years with very good results, is to plough under the stubble and to crop the land every other year. This is necessary because, if the previous year's stubble is burnt, so that the land may be cropped for two years in succession, the chances are that the land will drift and part of the crop be blown away. Further, it is seldom that a good crop grows on stubble land where a crop of straw is ploughed in just prior to seeding time. On land where the stubble has been ploughed in it is necessary that disc implements should be used, for a time at any rate, although the straw will generally have rotted before seeding time, and the land can then be worked with any ordinary tined implement, it will keep the fallow from drifting to any great extent. The sand might drift a little, but the fallow will not be blown right away, as is generally the case on land where the straw is not ploughed in. This is very important, as where the fallow drifts right away, leaving hard patches, rarely can a good crop be grown on them, and it is necessary to fallow them again before obtaining good results. Diversity of opinion exists as to whether in ploughing in the stubble there is a tendency to increase the amount of "takeall" in the crop following such treatment; but I do not think there is, and even if there were the loss that would occur through the "takeall" would not be so great as it is likely to be if the land drifted.

"In drilling sand-drift land it is advisable to do so when the land is wet, and leave the surface rough. Where possible always drill across the direction of the prevailing winds, as the furrows made by the drill will not then be filled up so quickly. I do not think it advisable for sheep to be kept on very sandy country, as they tend to increase the drift by treading the land into dust in the summer time, and as a rule very little feed grows on this class of land. In regard to fences, where sheep are not kept it obviates the necessity for sheep-proof fences and only the top wires need be used. Have no more fences than are necessary, and keep them clean by removing all obstructions that would be likely to stop the sand."

"Several landholders in our district are erecting fences of mostly iron standards, say from 20 to 30 standards between strong wooden posts for strainers. Although this fence is rather light where stock are kept, if strong wire is used it makes a good division fence, and it is easily kept clean, as weeds and rubbish can be burnt under it without fear of burning the posts, and if sand accumulates about it it can be raised up or removed altogether in a short time with very little trouble. It is almost impossible to keep a wire-netted fence from being covered with sand; so if rabbits are plentiful on sand-drift land it is advisable that concerted action be taken by the landholders to bring about their eradication, as they are sometimes the cause of giving the drift a start, and a considerable amount of damage may be done to the crop."

"One of the most important points to be aimed at in combating drift is not to let it get a start ; if once it starts drifting just after the crop is sown, most likely a large part of the previous year's work is wasted.

"In regard to implements, the disc ploughs are light in draught and they will cover the rubbish better than most other ploughs ; but in ploughing stubble, in some instances it would be advisable to take off the scrapers so as to leave a portion of the straw above the ploughing. For covering rubbish the wide furrows will give the best results, and the scrapers should be set low down on the discs. The wider the furrows are the longer will the discs keep clean, because of the extra amount of pressure there is on them. I have found the one-way disc cultivator a good implement which does satisfactory work ; it will cultivate up hard ground, and when used at the right time is a good weed killer. The ideal disc cultivator has not yet, however, been placed on the market, or if it has I do not know of it. A cultivator is wanted that would throw the furrows all the same way, cut about 6ft. in width ; that would pull quite straight, be light of draught and easy to handle. Such a cultivator as this would be of inestimable value to the holders of sand-drift land. The foregoing methods of dealing with sand drift are, in my opinion, the best in getting a crop started ; but on land that does not drift I would burn the stubble, as the land would be much more easily worked."

Mr. Malcolm (Kadina)—"I agree that one effective method of combating sand-drift is to drill across the direction of the prevailing winds. That is especially necessary where a farm is near the sea coast. I am pleased to find that district councils are taking a determined action to compel the people to destroy rabbits."

Mr. Lock (Whyte-Yarcowie)—"I had some experience with sand-drift at Lake Alexandrina. The sand-drift was in the form of hillocks. It was only a question of time when they would be blown away. I would like to know whether experiments with marram grass have been successful ? "

Mr. Roberts (Davenport)—"I come from a place where there is a good deal of sand-drift, so much so that houses have been altogether covered, especially on the plain between Flinders Range and Port Augusta. It is a tremendous place for the wind to play. During the drought the feed was all destroyed. The district councils granted a request to some farmers to fence in those drift portions. They ploughed it up and sowed wheat ; by that means they reclaimed them to a considerable extent. It seemed to me that some seeds stayed in the ground, and after taking off the crop there was no need again to plough, because the ground was covered with natural herbage. Marram grass does not do in this part because the rainfall is insufficient for its growth. The right thing to do in the case of sand-drifts is to plough and sow in the proper season ; after that natural growths will stop the drift."

Mr. Summers—"Marram grass will hold sand-drift near the coast with a fair rainfall. You do not put marram grass on land you want to cultivate. What the paper is seeking to do is to get suggestions on the handling of drift land for cultivation, and that is the line of discussion we should follow."

Mr. Lock (Whyte-Yarcowie)—"The idea is to hold sand-drifts by marram grass and cultivate the rest of the land. Otherwise the sand would drift off hillocks over a large extent of country. It is advisable to cultivate 50 acres and hold another 50 acres of drift by grass."

Mr. Hawkins (Port Pirie)—"It is impossible to work the drill over sandy ridges. Disc implements are practically of no use whatever with heavy land. You must have two sets of implements. Grass should never be burnt but ploughed in. I am talking of scrub lands. Another way to stop the drift is to plough in the straw. We will have to wait to see whether takeall will give any bother. I do not agree with the writer about keeping the sheep off. By having sheep to pick off the weeds it would help to keep the land clear. I have a few rabbits—one or two. (Laughter.) I keep them down with a poison cart, fumigator, and a little hard work."

Mr. Brown (Port Elliot)—"Would it not be possible to plant tree lucerne hedges, and so resist the drift?"

A Delegate—"Have you any idea how big our paddocks are?"

Mr. Gosden (Davenport)—"Our district has had considerable difficulty with sand-drift owing to the hillocks, and we found it essential to grow what we could on them. The trouble has been from without and not within. Crown lands are allowed to drift all over our crops and bury them. Wherever there are hillocks on farm lands the farmer encloses them and grows bushes, and in this way effectively reduces the drift."

Mr. Smart (Inkerman)—"It is better to have a poor crop than no crop at all. In connection with sand-drifts we have followed the practice of leaving often one and a half chains around fences; we cut foliage down and spread it over the tops of the sandhills. In other circumstances we drill sandy lands in the early part of the season. If the early rains come, and then we get warmer weather, we have found growth better on the sandhills than anywhere else. At any rate that has been my experience."

Mr. Fisher (Strathalbyn)—"I have had experience, both privately and through district councils. The council had a drift right across the main road and could not stop it. We purchased a paddock alongside, kept stock off it and planted bushes on the hillocks. That meant that the sand climbed higher and higher. Overcropping and overstocking are certain causes of sand-drift. The only way is to fence off the sand-drift and keep stock on in reasonable numbers for several years."

Mr. Summers—"In the south, from O'Halloran Hill to Willunga and Aldinga, they had fairly extensive sandhills, generally speaking carrying good pastures. At times they got south-east winds right through the summer. Overstocking or no overstocking, the land often starts to drift right on the top of the hill. One farmer had a grazing paddock which went this way. I suggested that he should follow an experiment I saw somewhere about the Lakes district. With the first shower in autumn run a drill across with the plough, and sow rye with a bit of super. That prevented the drift from going further. The sand got right down on to thin shelly limestone, and in places there was practically no soil left. The following year they kept stock off until the rye was practically ripe. Two years later in places the rye was up to my head. The farmer said if he had only attacked that drift earlier he would have saved himself many pounds. I have seen that tried in several places with success. The natural herbage soon comes back when the drift is held."

Mr. Johns (Port Pirie)—"We plough in the stubble on sandy lands, and I have not heard of a better method in this discussion. We leave sandy land alone as much as possible and cultivate all we can. My own crop during the present season is in some instances very poor, but in patches where the land is stiffer there is a strong crop. Whether this process has anything to do with takeall I cannot say, but I am inclined to think it has. I would sooner burn the stubble off if it were not for the drift sand."

Mr. Dawkins (Advisory Board of Agriculture)—"We have a large amount of sandy country in South Australia. I do not think such land should be cultivated unless it is very wet. The method of ploughing in the straw is a good one. My own experience teaches me that. If you plough late in the season the soil is left too loose and takeall is encouraged. Once the soil has started to drift, work it with a cultivator and so deal with the ridges. By ploughing in vegetable matter you build up the soil and encourage the growth of herbage."

Mr. Lock (Keith)—"I come from what is called the Ninety-Mile Desert. (Laughter.) We are supposed to know something about sand there. Our sand does not drift. In Port Pirie sandhills run across paddocks. I knew a friend of mine who had nearly all his crops blown away."

Mr. Wright—"I am sorry that I did not get as much information out of the discussion as I could have wished. I am dealing with drift land for cultivation specially. In some cases deep ploughing has been beneficial in holding sand."

HAYMAKING.

The following paper written by Mr. W. B. Davis, Brinkworth Branch, was read by the secretary (Mr. Summers).

"The great secret in cutting good hay is to have the machines in thorough working order, and have them started two or three days before the crop is ready to cut. I have known some farmers to have their machines in very bad repair, and when their crops ought to be down they have only just got their machines in working order. For the sake of a few extra fittings, which would cost about 30s. to £2, they lose more time and crop in trying to make the old thing do than the machine is worth. One hot, windy day at the time of the year when the crop is ready to cut will take 5cwt. to the acre out of it, and we will take this at £3 per ton. That would amount to more than the price of a new machine on 100 acres. This shows the importance of having the machinery ready. My idea of the variety of wheat for hay for the early market is King's Early, as it is a splendid weighing hay, and always grows so that a good sheaf can be obtained. Farmers have said that this wheat is injurious to horses, owing to the beard. I differ from their opinion, as I have used a great deal of it, and have handled some hundreds of tons for sale, and have never seen any horse die through the effects of it, but have seen more die for the want of it. The next best variety for market or for use as feed is Bluey (Dart's Imperial). This wheat is green from the very first knot in the stem, and has a good wide flag. It stands up well and grows a good strong straw, and when ready to cut (after the second flower is off the head) the machine can be started in it, and you can depend on having a beautiful green sheaf, as sweet as sugar, with a fair amount of corn in it, and the cattle will eat every straw that is given them. This is one of the best varieties I know of, but it is a rather late wheat. Another variety which most of our farmers have let go is the old Purple Straw. This is one of the best wheats for either market or feeding, but I am sorry to say it has almost gone out of existence in my old district. Of course, we all know that the wheat is a great sufferer in rusty years. Another wheat that I would strongly recommend is Marshall's No. 3. This is the nearest I know to the old Purple Straw just mentioned.

"The best time to cut wheaten hay is after the second flower has gone off. The straw must be white for about 2in. above the bottom knots. This will leave the first part of the stem a bright golden yellow. The rest of the stem will be a dark green, and the head a blue tint on the ear. If the crop is carefully examined the grain will be found formed, and on every day's work after this you will find more corn in it. I would say, to obtain the highest market price, hay should be dealt with in this way and stooked immediately after it has been cut, so as to keep the color. We all know that the greener we can keep the hay the better it will be for market. My experience is that as long as the stuff is a good color it will always demand a good

price. I have seen beautiful chaff cut from a light-colored hay, and if you were to blow the chaff from a handful you would find some 50 or 60 grains of wheat in it. I have known this chaff to be condemned. On the other hand, if you were to do likewise with the green hay you would find a few shrivelled grains, smaller than rice. I have known buyers to buy very inferior chaff, such as self-sown, cut green and mixed—two sheaves of self-sown and one of very light-colored hay—before they would look at the pure wheaten chaff. Now, to my idea, the hay cut with almost the full grain in it for feeding is worth 10s. per ton more than that which I have just mentioned. But the city buyers will not see this; they will have it green. Hay cut too green is liable to scour the stock, but when cut at the proper time there is no fear of this.

"Farmers should take a greater interest in oaten hay than they do. In my opinion the time for cutting Algerian oats, is when the straw is between a pink and a white. This hay can be cut two or three days too early, when it will be hard work to make the stock eat it, as it is so bitter, but when cut at the right time it is one of the best hays that farmers can have for their working stock, because it grows well on stubble land, and it has an abundance of corn in it, which gives life to the horses. It is not wise to use all oaten hay for feeding, but better to have it mixed, say one sheaf of oaten and two of wheaten hay. I have only mentioned the Algerian oats, but the other varieties are equally good.

"The best way to stack hay in case of bad weather is four sheaves deep, two in the centre and one each side. This will bring the heads in a sloping position. I have proved this method to be a thorough success, but the stooks must be made with the hands and packed tightly together. I have stooked 100 acres in this way, and have had 2in. of rain on it, and there was scarcely a sheaf damaged. If the stack is closed well with the two end sheaves the wind will not blow them over. I have seen 100 acres stooked with a fork after this style, and after a good wind the hay has been all over the paddock. It is a very pretty sight to see a crop of say two and a half tons to the acre well stooked, but it is a shame to see beautiful stuff lying exposed to the weather through carelessness. Another very good way of stooking to keep weight is to make the stooks round; but you must be very careful not to put too many sheaves in one stack, say 30 or 40, as in case of rain a greater portion of the middle ones will go black, as the air cannot get to them. But in the case of hot, windy weather, when the stooks are likely to remain in the fields for some considerable time, the round stack proves to be the best.

"Stacking should be started as soon as the hay will break off clean at the third knot of the stem, say about 10 to 14 days after cutting. This, of course, depends on the weather at the time of cutting. If the cutting is done in hot, windy weather the hay will be ready to cart much sooner than that cut in mild

weather. Of course, we are all anxious to get it into the stack as soon as possible, but very often we spoil tons of hay through stacking too soon. We cannot be too careful in this way. Every stack should have a good bed of straw, say 6in. to 1ft., and then put the first three layers with the butts out, and then fill the middle with heads out, say the first two layers, and this will save a lot from getting spoiled ; then build with all butts out to the top of the stack, and keep the middle about 3ft. above the sides. This will give the sheaf a good dip, so that the rain will not run into the middle of the stack. I am a great believer in stacking it all with the fork ; some farmers build the first two or three rows with the hands and knees, and then fill the middle with the fork. This will allow the stack when settling to sink in the middle, causing the rain to soak into the middle of the stack. I have carted stacks of hay that have been stacked in this way and with very little covering, and have had to throw away quite as much hay as I have carted. I cannot understand a farmer going to all the trouble of cutting a good crop, expense of twine and labor to put it together, and leaving it exposed to all weathers, for the sake of paying a man £2 10s. to thatch it, being a little more than the price of a ton of hay, while he may save in a good thunderstorm 10 tons of hay. A stack well built and thatched will stand from four to six years, and be just as good as the day it was put there. Let me say in conclusion that old hay well protected is old gold."

Mr. Summers—"I wish to emphasize that, so far as possible, writers of papers should read them here themselves. (Applause.) If the Advisory Board will support me I will issue a circular to the Branches of the Bureau setting out definitely that no paper will be accepted for the Congress unless the writer undertakes to read it. Delegates will agree that it is far better to have the writer present, so that questions can be put directly to him."

Mr. Hughes (Woodside)—"The paper is an exceedingly good one, and the writer knows how to harvest a good crop of hay. The farmer who stakes his sheaves in round stooks does not know how to make hay. It is better to mature the hay a trifle, because the horses do not relish their feed cut on the green side. We are told by scientific people that there is far more nutriment in oaten hay than in wheaten hay. Wheaten hay is, unfortunately, more popular in South Australia."

Mr. Thomson (Quorn)—"Considerably more farmers are going in for oaten hay, and have been doing so for the last three years. The day is not far distant when they will recognise that it is the proper food for horses. A good many farmers come from the old land, and there horses are fed on pure oats in addition to oaten hay. You get more cream from the cow with oaten hay chaff than with wheaten hay."

Mr. Dawkins—"The paper has evidently been written by a practical man. His advice is thoroughly sound. The writer seems to think King's Early

is very good hay wheat. It is a long way from being an ideal wheat. It is not a bad hay for horses, but it does not make as good chaff as other wheats. I do not find that it yields so heavy. An ideal wheat for hay is White Tuscan. It grows tall and races away from the weeds. It takes rust, but not badly."

A Delegate—"What about Majestic?"

Mr. Dawkins—"That is a really good wheat. It runs White Tuscan close. Marshall's No. 3 makes dirty chaff."

A Delegate—"What about Federation?"

Mr. Dawkins—"It is about the worst hay you could ever cut. The chaff is a dirty brown color. Very good advice is given in the paper about stooking. I believe Algerian hay is one of the best feeds for cows. If you get Algerian oats ripe and the season is good it makes really excellent hay, but you generally have to take 5s. a ton less, as there is only a limited demand. Experiments conducted some years ago proved conclusively that oaten hay cut fairly green was one of the best milk-producing feeds you could have for dairy cows. After all, very much depends upon the man behind the farm. I prefer leaving oats lie a day or two, especially if a little bit green."

Mr. Malcolm (Kadina)—"Some farmers have adopted cross drilling. Crops are exceedingly heavy this year. They put on 30lbs. of seed one way then 30lbs. the other. Cross drilling means extra labor, but experience shows that it is going to pay handsomely."

Mr. Uphill (Balaklava)—"I have grown Algerian oaten hay for seven or eight years. My horses are in average condition, and work as hard as any I know. It is a cheap crop, always sown on stubble land."

Mr. Jones—"I would like to find out whether King's Early hurts the horses."

Mr. Sandow—"A friend of mine told me that he had been growing King's Early for a number of years, and that there was not a horse in the stable that had not a bad mouth. That does not speak too well for King's Early."

Professor Perkins—"He cut it too dry."

Mr. Sandow—"I do not think so. I understand from Mr. Davis that he waits until the bloom falls from the bottom before he cuts. I generally grow Jonathan wheat for hay. I cut it fairly green and the horses eat every particle of it."

Mr. Lock (Whyte-Yarcowie)—"The writer says in his paper 'The best time to cut wheaten hay is after the second flower has gone off.' What does he mean by the second flower? I suggest that we should ask the writer and give his answer through the *Journal of Agriculture*."

Mr. Summers—"We will write for the explanation. I thought the writer was referring to the stage when the flower practically has fallen and gets very low down on the head. There is a suggestion that he may be referring to the lower heads, and that may be right. I was under the impression that there was not much sale for oaten hay until I took up the duties of Inspector of

Chaff. I was astounded at the large proportion of chaff sold in and around Adelaide and for export, consisting of oaten and wheaten hay mixed, in some cases mixed to the extent of half and half, or in a proportion of 1 to 2 and 1 to 3. I have been absolutely ashamed to see some of the stuff that is sent in from the farmers as hay. I am sorry I did not think of bringing samples here to show you, but they are available at my office. We are apt to look at the chaffcutter as a bad sinner, and I will not say that he is not at times. Sometimes he meets his match in the farmer. Smaller cutters are not in a position to stack, and they have to buy stacks from farmers. Some of the stuff is not hay at all. If the cutter makes any bones about it he has got mighty little chance with the farmer. I have seen hundreds of sheaves which have contained from one-third to two-thirds of charlock and poppy. I secured some sheaves and took them to pieces carefully. I found that in one case there was 63 per cent. of dry charlock, and in another 65 per cent. of dry poppy. It is a downright disgrace to the farmer who sold it. If I could induce the Government to do so I would get them to apply the Chaff Act to hay as well, and prevent that stuff from being sold as hay."

Mr. Draper (Keith)—"I have 60 acres of Cape barley and I have not found any harm come to the stock through the beard."

Mr. Smith (Angaston)—"King's Early makes a splendid chaff. I would sooner the writer cut it than me. It is most abominable stuff to handle. I have never found it interfere with the horses' mouths. A grower from the Murray Flats says that King's Early has only a slight beard. One of the meanest men I ever knew said he would not ask his men to cut it."

Tuesday, September 14th, 7:45 p.m.

Mr. W. Jamieson, M.P., presided over a large gathering.

HOW TO INCREASE EGG-PRODUCTION.

A paper was read by Mr. T. B. Brooks (Clarendon Branch) on "How to Increase Egg-production." It was as follows:—

"Eight years ago pure-bred poultry were found on very few farms in South Australia, but since the inauguration of egg-laying competitions a large number of farmers have taken on the pure bred in preference to the common barn-door fowl.

"During the year 1907 over £106,000 worth of eggs were exported from this State, and this is not half the amount that would be available if our farmers gave poultry their proper place on the farm, and made an effort to carry out a few of the following suggestions.

" To those of you who have no time for poultry, or who consider poultry beneath your notice, I advise you to give your boys and girls a start in the poultry business in a small way, allowing them to have the profit ; you will probably be surprised at the way they will look after fowls. Avoid the mistake so many farmers make of buying inferior stock. Secure good stock, or a setting of eggs, from a reliable breeder who has a good laying strain and a reputation to lose, and you will get the genuine article. Do not let the youngsters have more than six fowls till they can show a good profit per bird over cost of food.

" The profit from a good laying strain per annum should be 7s. 6d. per hen, made up as follows :—16½ doz. eggs at average price of 11d. per doz., 15s. 2d. ; cost of food for 12 months, 5s. 4d. ; rearing to laying age, 2s. 4d. These results can only be obtained by good feeding, warm houses, and not overcrowding.

" A great many farmers make a mistake in keeping a large flock, without any experience, and very often without any eggs. My advice to beginners is *go slow*. Profitable poultry-keeping requires just as much business tact as any other branch of farming. With a fair amount of energy and brains a large quantity of refuse that is usually wasted on the farm can be turned to good account if within the reach of good poultry.

" The easiest method to hatch chicks is by nature's way—broody hens. Select quiet birds of the heavy breeds, give them a secluded spot away from the others, and feed only grain while sitting. This method answers well where up to 150 or 200 chicks are reared, but where you want to raise over that number of chicks per year it is necessary to use incubators. I have known farmers buy a machine, get a list of instructions, and expect to run the machine right off the mark ; the result is usually a batch of cooked eggs. In any other branch of farming an expert is sent out to give the machinery a run, and give practical instruction to the buyer. It should be the same with an incubator ; failing this, go to a farmer who has a machine in use, or to the Agricultural College, and get a practical lesson, which is worth a lot of theory.

" Having hatched the chicks in an incubator, remove to a good brooder—this is just as necessary as a good incubator. Care must be taken not to get the brooder overheated. Provide plenty of scratching material, and feed chopped green grass the third day out of shell, and from that on feed as much or more green feed than anything else. Mash should not be given under three weeks, and meat-meal or green bone under one month. From six weeks chicks should have free range in small colonies of not more than 50 in each. Cockerels should be separated as soon as they can be distinguished from the pullets. Good sharp grit or gravel, charcoal, and lime, or better still, mortar, should be always before them ; this is necessary to raise good sturdy vigorous stock.

"Pullets reared in this way, hatched during September and October, start laying in February and March. Pullets starting to lay about the end of March are most profitable, and usually lay for 12 or 13 months without a spell if properly housed and fed. Houses should face north-east, or away from rough cold winds. I prefer houses built similar to Mr. D. F. Laurie's model, with scratching shed attached. Sleeping apartment should be closed in during winter months, as warmth at night is necessary for heavy egg-production. Do not let your birds roost on farm implements or in trees. Some say this is natural; so it is, but it is not natural for a hen to lay 200 eggs per year, and the hen that roosts in a tree will never do it. In order to get a good supply of eggs in winter months keep the birds warm at night, provide good dry litter in scratching shed, and the birds will amply repay the outlay.

"I have been experimenting this season, and find that birds on free range during June, July, and August laid far better than those in yards, and cost less to keep. In order to run a large flock successfully not more than 50 birds should be allowed to each colony. On one of the largest poultry farms in America, where 12,000 laying hens are kept, this is the method adopted. I do not advocate fowls running around the back door. Fence off house, flower, and vegetable gardens, and let fowls have their run outside this area. During the breeding season it is necessary to have a few pens; give these shelter from rough winds, as nothing curtails the egg supply quicker than rough stormy weather.

"To be successful, mate so as to secure more pullets than cockerels. I find that second-year hens mated to vigorous 10 months old cockerels give best results. From this mating, recently, I secured 35 pullets to 22 cockerels; and with pullets 10 months old and cockerels same age mated the result was just the reverse. The average farmer cannot spare time to trap-nest or single-pen his breeders, so I advise to notice the first one or two pullets in each clutch of chicks to lay an egg; these should be marked by a ring for the breeding pen. Another good plan is to watch your hens at moulting time; the bird that continues laying and carries her feathers longer than others of the same age is worth a place in the breeding pen; this is the bird that lays while eggs are scarce and dear.

"Feeding poultry for heavy egg-production requires experience. Heavy feeding of the dairy cow results in a large flow of milk; not so with the fowl. To feed all they will eat quickly fattens and reduces the egg yield. Mash is best for morning feed, consisting of pollard and bran mixed with same amount by measure of fine chaffed green stuff. On two or three mornings during the week add meat-meal. P.E.D. brand, made by the Government Depot at Port Adelaide, is the best on the market. At mid-day give a large supply of cut green stuff; for winter choose hot feed, such as mustard or rape, and for summer, kale and lucerne. The evening meal should consist of wheat and oats or peas (cracked) thrown into scratching sheds, which gives plenty of exercise and keeps the birds vigorous and robust.

"In conclusion, I wish to impress on the farmers at this Congress that you can lose money as fast on poultry, if neglected, as on anything else on the farm ; but on the other hand, if you give poultry regular attention, good feed, warm houses, keep them clean and free from vermin, they are great money makers.

"For egg-production the White Leghorns have proved themselves to be far superior to all others. This breed holds the 'world's record' and secures the bulk of prizemoney at egg-laying competitions. Being non-sitters, they may be expected to keep on laying right through the year ; and this is the class of fowl which, if properly treated, will greatly increase the egg production of South Australia."

Mr. Brooks was vigorously questioned at the termination of his paper, and in the course of his replies he made another valuable contribution to the subject. His later remarks may be summarised as follows :—"If you mate a two-year old male with young females you will find that nature tries to reproduce males. When you are short of green feed it is advisable to use green wheaten or oaten hay after steaming it. If we run short of green stuff, we chaff this up finely and give it in the feed. It is better than stuff on the dry side. Cut the stuff green in the milky stage. I live in a favored district, and have not found it necessary to resort to feeding with ensilage. I think it would be a first-rate food: I wish to emphasize the value of a scratching-yard, because when fowls are huddled up the egg-manufacturing machinery will not do its work. It is necessary to mate birds on scientific lines as nearly as possible. Mr. Laurie has a splendid chart for breeding, and if that is followed you will have far better results than by adopting a haphazard business. The hens that lay right through autumn into June I class as A1 layers. I use them for my special breeding pens. I am very careful—and I advise others to be—in the matter of introducing fresh blood. Do not get far away from your own strain, if you have a tip-top one. Stick to it as closely as possible. In connection with scratching, I run a drain around the top of the fowl-yard, make the floor 6in. of coarse material, and 6in. of sand on top of that to keep out the damp. I never allow a male bird in a pen with females, except in the breeding season. We always go for infertile eggs."

EXPORT OF EGGS.

The Government Commercial Agent (Major Norton, D.S.O.) gave an address on "The Export of Eggs." He opened with an excellent retrospective account of the egg trade, and in a lucid manner traced its development up to the present day. South Australia was the finest country in the world for the production of poultry and eggs. It was only common-sense to say that oversea markets would have to be soundly established. The other States were equally able to raise poultry as South Australia, and what greater encouragement could they give their neighbors than to keep prices high in South Australia ? South Australia's production was annually

increasing, and the other States in their turn were becoming more self-supporting. The Commercial Agent referred to the experimental shipment of eggs which went to London at the end of 1906, and spoke of the prejudice which prevailed in England regarding eggs in South Australia. Now, after considerable effort, a trade had been opened up, and he asked them whether they were going to let it slip through their fingers. It was far better to get a surplus right outside the Commonwealth, than to put up with the depressing effect of pickled eggs on the market when eggs should be dear. In any case, the export business should be regarded as a means of maintaining local prices at all times. He hoped that when the time came for shipments the response would be very ready. Organisation was essential. This led him to emphasize the necessity for the establishment of egg circles.

Major Norton proceeded :—" Ever since I have been back I have been endeavoring to find out the market price of eggs in Adelaide. For the last month I have been trying to do that. One market report says one price and another $\frac{1}{2}$ d. below that, and still another one something else. They all vary in a remarkable manner. You will find the inter-State markets differ also. We have been anxious to find out the legitimate market price for eggs in South Australia, and so a new system is being introduced. Of course you have all heard about it by now. I refer to egg circles, which have been adopted with wonderful success in Denmark, Germany, America, Canada, and some parts of England. People have been attempting to throw cold water on this business ; but our idea is to get a better system of marketing, and nobody will deny that that is absolutely necessary. We have proved beyond doubt that eggs can be shipped to England on a very profitable basis. I do not blame one merchant for not shipping, because the man that ships makes a better price than the man who does not. In other countries the egg business is carried on at profit, but in South Australia merchants will tell you that it is one of the most unprofitable branches in their trade. It is stated that the regulations concerning egg circles are technical. Some people have a very funny idea of technicalities. All that is necessary is that people belonging to the circles shall undertake to have eggs collected every day and put a stamp on them. Why a child could do it. By sending eggs to England we are going to clear the glut from South Australia and get a higher price for fresh eggs. It has been argued that if we send eggs to England we will put up a price in Adelaide for the consumer. The result of that would be that people will keep fowls. Very few do at present. It is a matter of indifference to me whether egg circles are formed in South Australia or not. I have no axe to grind, but I want to see the poultry industry go ahead. I heard one man say that he was going to upset the whole thing. Egg circles are not a new-fangled idea by any means. They have been adopted most successfully in progressive countries. When our circles are formed right around the country it will mean that every circle will have to bear its proportion of the export to England. The whole matter rests with the producer.

The system has to be organised and somebody has got to do it. The whole scheme is ready for the co-operation of the producers. Egg circles will mean that we will get a very large number of good sound eggs instead of a lot of bad ones. There is as little to fear from the competition of Chinese eggs as there is from Russian eggs. Our competitors in England are falling off. Canada used to send a lot of eggs to England, but this has not been the case during the last few years. Although the poultry industry in America was worth over £100,000,000 in 1899, and the price of eggs in New York was 11 cents a dozen, in 1907 the price was 18 cents. In England the population is increasing enormously, and the supply of good eggs is decreasing."

Mr. Engelbrecht (Mount Gambier)—"The careless handling of eggs and poultry by the railways is a matter of grave concern, and should be drawn attention to. What use is it to develop a trade if safe carriage is not to be expected? I have had personal experience. Out of 200 eggs specially procured for hatching and consigned to me, 49, or nearly 25 per cent. were broken in railway transit. Similar experiences are common in the South-East. I ask gentlemen present whether in all fairness that is the treatment we should receive when we are trying to transport our produce. I am told that one man at Mount Gambier always allows from $1\frac{1}{2}$ doz. to $2\frac{1}{2}$ doz. for breakages, yet the cases are packed with the utmost care by him. It seems to me that before we talk about sending stuff away we will have to have somebody at this end to remedy faults. I have noticed that when a train is late stuff is pitched about in brakevans in all sorts of ways. I have seen small packages thrown 3yds. or 4yds. The eggs I referred to were marked in large letters—'Valuable eggs for hatching.' This notice was put on both sides of the case, and they did hatch. (Laughter.) Is it worth while sending poultry to England? It has not been profitable to me. I had some prize chickens and ducks. I refused 6s. a pair in Adelaide, sent them to London and got under 3s." (Laughter.)

Major Norton—"Unfortunately, I am bound to say there is something in what Mr. Engelbrecht has said regarding the transhipment of eggs on the railways. The organising secretary of the co-operative egg circles is trying to minimise the possibility of breakages. In the new system eggs are packed in a manner which practically defies anything but most trifling damage. Boxes are specially prepared, and contain wood-wool and fillers; chaff is discarded altogether. No eggs should be packed in chaff. It is an antiquated method. I may say that we have already eight or ten circles going, and in one case with 100 members. (Hear, hear.) No fresh eggs are rejected. There is a market in England for all graded eggs. The regulations of the egg circles, it should be pointed out, may be altered to suit local conditions. Infertile eggs are the eggs that we must come to eventually. Some eggs sent to England have been far from infertile. For all culinary purposes infertile eggs are not to be beaten."

[The balance of the report of the Congress will be published next month.—ED.]

THE WHEAT MARKET.

Since the 10th of August the price of wheat on trucks at Port Adelaide has remained at 4s. 6d. per bushel throughout September, and there is still no prospect of a change. In Victoria the price has been almost as stationary as in South Australia, but has been, on an average, $\frac{1}{2}$ d. a bushel better, while in New South Wales the quotation has been from $3\frac{1}{2}$ d. to 4d. a bushel higher than in South Australia. Taking the quantity of wheat being exported into consideration, it is certain that South Australia will this year have a small "carry over," and those who are dependent on the wheat stocks in the country will no doubt be glad when the new season arrives.

The news with respect to crop prospects in nearly all parts of the world is at the present time most favorable. In Great Britain the percentage of "perfectly healthy" crops is given as 96.6 as against a 10 years' average of 93.5.

The most glowing accounts of the wheat crop continue to be received from Canada, and the reports from the United States are equally as favorable. Russia is reaping an abundant harvest, and it is the Russian wheat that is largely the cause of the dull market in England. In the Argentine there is little or no change to the news published last month, namely, that a smaller area has been planted, and that the crops are very favorable on the whole, except in southern Argentina where the effects of the drought are still apparent.

The grand total of the wheat crop of the world is estimated by "Beerbohm" at 421,120,000qrs., as against 397,840,000qrs. last year, Australasia's contribution for the coming harvest being calculated at 10,000,000qrs.

In reviewing the wheat position on August 27th, *Beerbohm's Evening Corn Trade List* said, "The world's statistics of supply and demand for a number of years show that the world's requirements for the coming season must be between 420,000,000qrs. and 425,000,000qrs., so that abundant supplies are not likely to mark the season as a whole; whilst, if anything should happen to mar crop prospects in Argentina, Australasia, or India, we might find the same difficulty in meeting the demands of importing countries as has been noticeable during the past season. With regard to the European requirements during the coming season, we think that there is little doubt that they will considerably exceed the actual imports of the two past seasons, which have been remarkably small, and have been only made to suffice by drawing freely upon reserve stocks, a process always attended by advancing prices, as we have witnessed during the past season." The Hungarian Minister of Agriculture estimates the world's production at 430,000,000qrs., or 9,000,000qrs. better than "Beerbohm."

Date,	LONDON (Previous Day).		ADELAIDE.		MELBOURNE.		SYDNEY.	
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.
Sept. 8	Very dull ; off coast 5/2½ (s.)	5/1½	4/6	4/6	4/5 to 4/5½	4/9½	4/8½ (b.)	4/9 to 4/10 (s.)
9	Steady ; little inquiry off coast	5/1½	4/6	4/6	4/5 to 4/5½	4/8½	4/10	4/9 to 4/10
10	—	—	4/6	4/6	4/5½ to 4/6	—	—	—
11	Quiet	—	4/6	4/6	—	4/6	—	4/8½ to 4/8¾
13	—	—	4/6	4/6	—	4/6	—	4/10 (s.)
14	Firm ; quiet	—	4/6	4/6	—	4/6	—	4/10
15	Very firm ; (s.) higher	—	4/6	4/6	—	4/6½	—	4/10
16	Firm ; quiet	—	4/6	4/6	—	4/6½	—	4/10
17	Very dull	—	4/6	4/6	—	4/6½ to 4/7	—	4/10
18	Quiet	—	4/6	4/6	—	4/6½ (b.)	—	4/10 (nom.)
20	—	—	4/6	4/6	—	4/6½	—	4/10
21	Quiet ; easier	—	4/6	4/6	—	4/6½ to 4/6¾	—	4/10 to 4/10½ (s.)
22	Dull	—	4/6	4/6	—	4/6½ to 4/7	—	4/10
23	Steady ; quiet	—	4/6	4/6	—	4/6½ to 4/7 (p.)	—	4/9½ to 4/10
24	Quiet	—	4/6	4/6	—	4/6½ ; 4/7 (p.)	—	4/9½
25	Dull and neglected	—	4/6	4/6	—	4/6½	—	—
27	—	—	4/6	4/6	—	4/6½	—	4/9½ to 4/10
28	Dull ; easier	—	4/6	4/6	—	4/6½ to 4/7	—	4/9½
29	Firmer	—	4/6	4/6	—	—	—	—
30	Firm	—	4/6	4/6	—	—	—	—
Oct. 1	—	—	4/6	4/6	—	—	—	—
2	—	—	4/6	4/6	—	—	—	—

STEAMER FREIGHTS.—Port Adelaide to London, 20s. per ton (6½d. per bushel); Port Adelaide to Sydney, 10s. 6d. per ton (3½d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2½d. per bushel).

SALE FREIGHTS.—South Australia to United Kingdom or Continent, new season's loading, 23s. per ton (7½d. per bushel); South Australia to South Africa, new season's loading, 20s. per ton (6½d. per bushel).

The freight market is firm with an upward tendency.

RAINFALL TABLE.

The following table shows the rainfall for September, 1909, at the undermentioned stations, also the average total rainfall for the first nine months in the year, and the total for the nine months of 1909 and 1908 respectively :—

Station.	For Sept., 1909.	Avg. to end Sept.	To end Sept., 1909.	To end Sept., 1908.	Station.	For Sept., 1909.	Avg. to end Sept.	To end Sept., 1909.	To end Sept., 1908.
Adelaide	1.73	16.76	21.86	19.81	Hamley Brdg.	1.61	13.12	17.19	13.97
Hawker	0.29	9.38	12.55	10.53	Kapunda	1.66	15.88	21.45	15.19
Cradock	0.29	8.40	10.67	8.83	Freeling	1.48	14.23	18.00	15.08
Wilson	0.33	9.09	11.25	10.75	Stockwell	1.56	16.29	19.51	17.09
Gordon	0.30	6.77	10.57	10.62	Nuriootpa ...	1.88	17.11	22.58	18.82
Quorn	0.26	10.74	13.18	12.13	Angaston ...	1.97	17.47	23.49	19.81
Pt. Augusta ..	0.62	7.10	10.85	9.44	Tanunda ...	1.77	17.85	24.06	18.75
Pt. Germein ..	0.78	9.65	13.28	14.65	Lyndoch ...	1.93	18.02	22.56	21.42
Port Pirie ...	1.08	10.13	12.00	13.58	Mallala ...	1.97	13.43	17.45	15.40
Crystal Brook	1.17	11.89	16.22	15.10	Roseworthy ...	1.47	13.93	18.14	14.63
Pt. Broughton	1.01	11.40	14.14	13.03	Gawler ...	1.68	15.58	21.18	15.52
Bute	1.38	12.35	14.77	15.30	Smithfield ...	1.62	13.19	18.02	16.96
Hammond ..	0.48	8.29	12.45	14.12	Two Wells ...	1.87	14.53	16.00	13.15
Bruce	0.32	6.90	9.61	16.08	Virginia ...	1.55	14.18	18.55	15.28
Wilmington .	0.75	14.12	18.22	20.50	Salisbury ...	1.84	14.96	19.25	15.63
Melrose	1.27	18.43	26.27	31.57	Teatree Gully ...	2.28	22.62	31.33	31.36
Booleroo Cntr.	0.60	12.41	15.49	15.90	Magill ...	2.26	20.91	30.04	24.70
Wirrabara ...	1.46	14.84	21.85	16.71	Mitcham ...	1.76	21.92	25.13	21.30
Appila	1.11	11.44	14.84	16.36	Crafers ...	4.08	38.48	55.46	44.88
Laura	1.19	13.89	21.20	22.49	Clarendon ..	2.77	33.17	35.62	27.36
Caltowie	1.18	13.26	16.00	19.10	Morphett Vale ...	2.39	19.18	25.10	17.64
Jamestown ..	1.27	13.30	17.18	16.86	Noarlunga ...	2.11	16.71	23.31	18.64
Gladstone ..	1.33	12.23	14.56	17.56	Willunga ...	2.16	21.60	29.23	20.31
Georgetown ..	1.30	14.46	16.15	17.70	Aldinga ...	1.71	16.84	23.25	16.54
Narridy	1.18	13.43	14.23	15.81	Normanville ...	2.03	17.27	21.31	16.67
Redhill	1.32	13.14	17.51	19.42	Yankalilla ...	2.60	18.62	22.60	19.43
Koolunga ...	1.26	12.32	16.34	17.76	Eudunda ...	1.29	13.42	14.22	15.15
Carrieton ...	0.41	9.12	12.91	11.02	Sutherlands ...	0.69	—	10.38	—
Eurelia	0.49	10.09	12.37	14.42	Truro ...	1.44	15.58	21.09	18.08
Johnsbury ..	0.77	7.41	10.72	8.27	Palmer ...	1.10	—	14.44	13.22
Orroroo	0.36	10.47	12.64	12.36	Mt. Pleasant ...	1.70	22.33	25.99	24.86
Black Rock ..	0.33	9.17	12.97	12.06	Blumberg ...	1.73	24.62	28.63	27.42
Petersburg ..	0.62	9.87	12.00	13.07	Gumeracha ...	2.81	27.42	38.00	29.92
Yongala	0.68	10.49	12.73	13.18	Lobethal ...	2.82	29.96	38.74	30.74
Terowie	0.78	10.22	12.05	13.25	Woodside ...	2.99	26.08	36.35	29.99
Yarcowie....	1.00	10.53	13.78	14.34	Hahndorf ...	2.82	29.43	35.86	30.74
Hallett	0.93	12.80	13.07	15.78	Nairne ...	1.59	23.77	30.89	23.96
Mt. Bryan ..	0.84	12.65	13.20	12.57	Mt. Barker ...	2.30	25.65	32.15	24.15
Burra	0.94	14.20	16.44	16.68	Echunga ...	2.85	26.97	38.76	27.70
Snowtown...	1.03	12.54	16.12	18.93	Macclesfield ...	2.57	25.09	34.31	25.73
Brinkworth..	1.38	11.67	15.01	17.48	Meadows ...	3.00	29.15	38.53	29.61
Blyth....	1.92	12.91	18.89	18.20	Strathalbyn ...	1.95	15.56	23.54	16.86
Clare	2.22	19.69	25.53	24.26	Callington ...	1.71	12.86	16.69	13.02*
Mintaro Cntrl.	1.57	17.75	22.82	20.61	Langhorne's B	1.63	12.29	14.38	11.83
Watervale...	2.30	22.19	28.50	26.72	Milang ...	1.71	13.68	16.15	13.37
Auburn	2.65	19.53	30.72	23.89	Wallaroo ...	1.02	11.29	15.53	14.77
Manoora	1.48	14.47	18.12	16.69	Kadina ...	1.23	13.13	17.32	13.92
Hoyleton....	1.45	14.66	17.54	16.15	Moonta ...	1.52	12.44	17.72	14.71
Balaklava ..	1.64	12.68	15.74	15.72	Green's Plains	1.09	12.80	17.38	17.54
Pt. Wakefield	1.62	10.59	12.81	12.99	Maitland ...	1.54	16.58	21.70	17.37
Saddleworth ..	2.54	16.10	19.47	16.37	Ardrossan ...	1.09	11.35	14.41	15.00
Marrabel ...	1.93	14.34	22.51	17.23	Pt. Victoria ..	0.99	12.50	14.79	13.76
Riverton ...	1.76	16.47	21.93	17.17	Curramulka ...	1.33	15.50	18.38	12.69
Tarlee	1.62	13.87	18.30	13.32	Minlaton ...	1.38	14.60	16.67	12.85
Stockport ...	1.31	12.80	15.70	12.60	Stansbury ...	1.91	14.04	18.11	13.58

RAINFALL TABLE—*continued.*

Station.	For Sept., 1909.	Av'ge. to end Sept.	To end Sept., 1909.	To end Sept., 1908.	Station.	For Sept., 1909.	Av'ge. to end Sept.	To end Sept., 1909.	To end Sept., 1908.
Warooka . . .	1.03	14.01	15.10	14.32	Bordertown . . .	1.63	15.65	17.85	14.19
Yorketown . . .	0.95	14.72	15.07	12.43	Wolseley . . .	1.57	13.71	18.76	14.02
Edithburgh..	0.89	13.69	14.14	12.31	Frances . . .	1.89	15.74	18.65	12.91
Fowler's Bay. .	0.24	10.51	10.34	11.85	Naracoorte . . .	1.88	17.89	21.68	15.93
Streaky Bay. .	0.53	13.28	15.80	13.33	Lucindale . . .	2.02	18.81	23.75	17.36
Pt. Elliston . .	0.78	14.00	16.36	17.06	Penola . . .	1.81	21.44	24.93	19.27
Pt. Lincoln . .	0.85	17.11	16.28	17.31	Millicent . . .	3.03	24.88	33.98	24.30
Cowell	0.71	9.49	8.43	12.83	Mt. Gambier . . .	3.45	25.53	34.97	28.80
Queenscliffe . .	1.44	15.57	16.23	14.84	Wellington . . .	1.78	11.90	17.06	12.31
Port Elliot . . .	1.77	17.12	16.47	14.76	Murray Bridge . . .	1.66	11.16	17.22	11.70
Goolwa	1.62	14.62	20.47	15.17	Mannum . . .	0.91	9.39	12.17	8.89
Meningie. . . .	2.70	15.64	21.13	14.81	Morgan	0.57	6.66	7.29	4.89
Kingston. . . .	2.18	20.47	26.47	22.83	O'land Corner . . .	0.98	8.37	8.43	9.48
Robe	2.02	20.91	26.24	20.44	Renmark. . . .	1.26	7.73	9.69	6.46
Beachport. . . .	2.75	22.89	33.23	22.71	Lameroo . . .	1.60	—	15.54	—
Coonalpyn . . .	1.83	14.07	19.60	13.22					

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co. report:—

THE WEATHER.—Following the excellent rainfall during the winter, ideal spring conditions generally prevailed in September, and it is questioned if at any corresponding period farming prospects ever promised better. Quantities of growing feed are in abundance, so that dairy herds are in good heart.

BREADSTUFFS.—Flour eased during the month to the extent of 10s. per ton, a fair export trade being done with South Africa.

FOODERS.—With such plenteous supplies of growing feed chaff merchants had a slow time, only a few shipments having been forwarded to Sydney. Mill Offal.—Sales quiet, values unchanged. Feeding grains, in sympathy, had very little call.

POTATOES AND ONIONS.—The Commonwealth markets in potatoes were considerably disturbed, owing to the reported presence of Irish blight in several of the States affecting the tubers, and this, coupled with severe restrictions imposed regarding shipments, resulted in values running down. It is now getting late in the season, and holders, especially in Victoria, at end of month were offering at reduced rates so as to clear, and with warmer weather setting in—thus affecting the keeping properties of the tubers—there is very little chance of a recovery in quotations now being made. In onions the market has been without any animation, trade being of a limited character.

DAIRY PRODUCE.—From a producer's standpoint the month's sales were exceptionally favorable, the weather assisting in this direction, whilst also the markets locally and for export were sufficiently active to keep the rooms well cleared of all surplus lines. In

butters there was a heavy increase in the quantities of fresh prints forwarded, and whilst it was pleasing to find a greater local consumption, still this was not sufficient to absorb the extras offering. However, packers for shipment operated freely, and all consignments found a ready quittance. Buyers for Britain were also purchasing, and factories are wisely packing into bulk for export, which is helping to maintain values. In eggs the heavy glut predicted by some is fortunately further off than ever, for each year additional larger buyers from the neighboring States are attracted to the Adelaide market, and as a result higher rates now obtain for all guaranteed lines. Cheese.—Sales were extensive, but prices at the end of September were disposed to ease owing to the lower quotations offering from elsewhere. Bacon and Hams.—After some months of low prices and dull trade, curers are appreciating the speedier turnover and the improvement in values that now exists. Honey.—British business has obtained for well-flavored clear extracted, but there has been the usual difficulty in finding an outlet for lower grades. Almonds.—The demand has been a strong one throughout, but the season is now practically over, and no parcels are available for shipment.

CARCASS MEAT.—The forwardings of pork for the Friday auctions meet with favor all round, judging by the prices realised and the attendance of buyers, who bid spiritedly for all prime shop porkers weighing from 60lbs. to 90lbs., and also baconers from 115lbs. to 140lbs., for which satisfactory rates were secured, whilst well-conditioned heavy choppers sold readily. In veal, prime farmers' fed, with just the pelt on but without head and feet, had best competition, and good figures ruled, but near the close of the month the live market was over-supplied, and in sympathy prices of veal eased, especially for medium or poor quality. It is, however, getting late in the season, and consignors would be wise not to forward during sultry or hot weather.

LIVE POULTRY.—For quite a number of months restaurant, hotel-keepers, and others have experienced considerable trouble in getting anything approaching their needs, and in consequence almost record tall figures were secured at the later sales.

MARKET QUOTATIONS ON OCTOBER 1.

FLOUR.—City brands, £10 15s.; country, £10 10s. per ton of 2,000lbs.

BRAN.—11d.; pollard, 1s. per bushel of 20lbs.

OATS.—Local Algerians, 1s. 8d. per bushel of 40lbs.

BARLEY.—Cape, 2s. to 2s. 2d. per bushel of 50lbs.

CHAFF.—£3 10s. to £3 12s. 6d. f.o.b. Port Adelaide per ton of 2,240lbs.

POTATOES.—Gambiers, £4 12s. 6d. to £4 17s. 6d. per ton of 2,240lbs.

ONIONS.—Gambiers, nominal, £8 to £8 10s. per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 9½d. to 11d.; choice separator and fine dairies, 8d. to 9d.; stores and collectors, 7½d. to 7¾d. per lb.

CHEESE.—Factory makes, 6d. to 6½d. for large to loaf, matured up to 8d. per lb.

BACON.—Factory cured sides, 8¾d. to 9½d. per lb.

HAMS.—In calico, 10d. per lb.

EGGS.—Loose, 8½d. per dozen.

LARD.—Skins, 7d.; tins or bulk cases, 6½d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb.; dark and discolored lots, 1d.; **BEES-WAX.** 1s. 1d. per lb.

ALMONDS.—Soft shells, brandis, 6½d.; mixed soft shells, 5½d. per lb.; kernels, 1s. 2½d. per lb.

CARCASS MEAT.—Prime shop porkers and good baconers, 5½d. to 6½d. per lb.; rough and medium sorts, 3d. to 4d.; fair quality veal, 1d. to 2d.; poor stuff, lower.

LIVE POULTRY.—Heavy weight table roosters, 3s. 3d. to 4s. each; plump hens and light, 2s. 3d. to 3s.; ducks, 3s. to 3s. 6d.; geese, 3s. to 4s.; pigeons, 9d.; turkeys, 9d. to 11d. per lb. live weight, for fair to good table birds.

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Oct.	Nov.			Oct.	Nov.
Amyton	*	—	—	Meadows	*	—	—
Angaston	265	23	27	Meningie	*	2	27
Appila-Yarrowie	*	—	—	Millicent	*	19	16
Arden Vale & Wyacca	†	25	—	Miltalie	271	23	6
Arthurton	*	—	—	Minlaton	*	2	6
Balaklava	†	9	—	Mounta	†	28	—
Beetaloo Valley	259	—	—	Morchard	257	—	—
Belalie North	259	23	20	Morgan	†	23	27
Bowhill	274	—	—	Morphett Vale	*	19	—
Brinkworth	259	26	23	Mount Bryan	261	—	—
Bute	*	26	23	Mount Bryan East ..	†	2	6
Butler	*	—	—	Mount Gambier	*	—	—
Caltowie	260	25	22	Mount Pleasant	*	8	12
Carrieton	*	28	25	Mount Remarkable	*	28	25
Cherry Gardens	278	26	23	Mundoora	261	—	—
Clare	267	29	26	Nantawarra	269	27	24
Clarendon	*	25	22	Naracoorte	*	9	13
Colton	*	30	27	Narridy	261	—	—
Coomooroo	256	4	1	Northfield	269	26	23
Coonalpyn	275	—	—	Orroroo	*	—	—
Cradock	256	23	27	Parrakie	276	2	6
Crystal Brook	*	—	—	Paskeville	270	23	27
Cummins	270	28	27	Penong	272	16	13
Davenport	256	—	—	Petina	*	—	—
Dawson	*	—	—	Pine Forest	†	26	23
Dingabledinga	*	8	12	Port Broughton	†	29	26
Dowlingville	*	—	—	Port Elliot	281	16	20
Forest Range	*	28	25	Port Germein	*	—	—
Forster	275	—	—	Port Pirie	262	23	—
Fowler Bay	*	23	20	Quorn	258	—	—
Freeling	267	—	—	Redhill	*	16	20
Gawler River	*	—	—	Remark	*	—	—
Georgetown	*	30	27	Rhine Villa	277	—	—
Geranium	*	30	27	Riverton	*	23	27
Golden Grove	279	28	25	Saddleworth	*	15	19
Goode	*	—	—	Shannon	273	—	—
Green Patch	*	25	22	Sherlock	277	—	—
Gumeracha	280	25	22	Smoky Bay	*	—	—
Hartley	281	23	—	Stansbury	*	—	—
Hawker	*	2	27	Stockport	†	25	22
Inkerman	*	28	25	Strathalbyn	*	18	15
Johnsbury	*	23	—	Sutherlands	*	—	—
Kadina	*	2	6	Tatiara	*	—	—
Kalangadoo	*	—	—	Uraidla and Summert'n	†	4	1
Kanmantoo	*	22	26	Utera Plains	274	23	27
Keith	283	—	—	Virginia	*	—	—
Kingscote	281	5	1	Waikerie	*	—	—
Kingston	†	30	27	Watervale	*	—	—
Koolunga	†	26	23	Wepowie	258	—	—
Koppio	271	28	25	Whyte-Yarcowie	263	30	27
Kybybolite	283	28	25	Willunga	†	2	6
Lameroo	276	—	—	Wilmington	†	28	25
Lipson	*	—	—	Wirrabara	258	—	—
Longwood	†	2	24	Woodside	282	—	—
Lucindale	*	—	—	Yallunda	*	—	—
Lyndoch	*	28	—	Yongala Vale	265	23	27
Maitland	269	2	6	Yorketown	*	9	13
Mallala	268	4	1				
Mannum	276	30	27				

* No report received during the month of September.

† Only formal business transacted at the last meeting.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

Coomooree, August 30.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Berryman (chair), J. and Jer. Brown, C. and E. Brice, Hall, J., L., and H. Phillis, Avery, Kildea (Hon. Sec.), and one visitor.

FIELD TRIAL.—Considerable discussion took place on recent trial of ploughs, &c., at Walloway. Mr. H. Avery did not like the concave mouldboard on the Shearer ploughs, as it did not turn the sod as well as he would like. The lever on these ploughs was very convenient to use, whether riding or walking. He considered shares made of plate steel better than the cast, as they enter the hard ground better, and make the draught lighter. Though cast shares cost less, the others were cheaper in the long run. Mr. Phillis liked the mouldboard on the May Bros. ploughs, as it was a good shape and turned the sod completely. Mr. Jas. Brown considered the clock-spring plough too heavy to lift out of the ground, though they work well in stony ground. It was generally considered that a plough with a P foot required appropriate mouldboards. Wheels with movable boxes and wrought iron parts were preferable to castiron wheels, as the latter were too heavy, and were more easily broken. Convex mouldboards turned the sod better than concave, while for sticky ground the prong mouldboards were useful. Large wheels were considered better than small, as they run lighter. It was resolved to give a public denial to the statement which had been published to the effect that the only ploughs sold at the field trial were fitted with the clock-spring attachment.

Cradock, August 28.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. Lindo (chair), Glasson, Hilder, Paterson, Solly, Finch, Sullivan, Clarke, Richards (Hon. Sec.), and one visitor.

Egg CIRCLES.—It was considered that egg circles in this locality were impracticable.

PREPARATION OF WOOL FOR MARKET.—Mr. Clarke asked whether the members thought it advisable to adopt the late Wool Expert's method of skirting fleeces in this district. The Chairman would follow him in some points, such as having the fleeces in a bale of a uniform quality, and the easiest way to do that was to breed uniformly. Mr. Clarke considered it would pay to follow Mr. Mathew's advice in every detail.

Davenport, August 26.

(Average annual rainfall, 9in.)

PRESENT—Messrs. Bothwell (chair), Roberts, Holdsworth, Hewitson, Bice, and Leeky (Hon. Sec.).

CATTLE-BREEDING.—Mr. Hobby's paper on this subject was read, and discussion held over till next meeting. The Alderney was a very nice cow to keep as a family beast, and as a milker could not be beaten. The milk was rich and good. The only fault he found with them was that when milking days were over the beast was too small. The Hereford was a fine heavy beast, but not a quick maturer for the market, rather inclined to be wild, and not suitable for a small herd. The Durham or Shorthorn he considered to be the best cattle to breed. It was a treat to go on to those stations where these cattle were stocked. He should advise farmers to go in for the Shorthorns. They would find

among them as good milking cows as in any other breed. The market value of these cattle, too, must be taken into consideration, as compared with any other breed. They had quality both in beef and milk. If three or four farmers with a good class of cows would join and get a good Shorthorn bull they would soon have a decent herd of cattle. They must be careful in selecting a bull—in color he liked the light-roan best, square on the back, with the tail well set on the rump, flat, not like those with the tail sticking up 3in. above the rump-bone. This never showed the fat to be seen on the flat tail. The calves took after the father more than the mother.

Morchart, September 11.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Scriven, sen. (chair), McCallum, Peak, Scriven, jun., Jasper, Munro, Parsons, Reichstein, J. McDougall, Kirkland, Tilbrook, Kitto, Toop, and J. B. McDougall (Hon. Sec.).

CARE OF HORSES' FEET.—A paper to the following effect was read by Mr. Reichstein at the previous meeting:—“Where horses went on metal roads and stony ground it was necessary for them to be shod. The shoe should be made to fit the hoof and not *vice versa*. It was better for the shoe to be a little large than too small. He considered it best to level the hoof with a rasp and then fit the shoe, taking care that it was straight. Before nailing he would give it a little spring on the heels. Seven nails were sufficient. It was not good to put many holes in the hoof, and if the shoe was not bedded properly no amount of nailing would keep it on. In cleaning off any hoof that was standing over care must be taken not to damage it above the clenches with the rasp, as that would take the gloss off and remove the natural protection against the weather.

HORSEFEED.—Mr. Tilbrook read a short paper in which he deprecated the practice of only providing sufficient horsefeed to last through harvest and seeding. This necessitated turning the horses out to wait for the feed to grow, and resulted in losing the best time for fallowing. It was not every year that they were favored with a good hay cut in this district, and when they were so favored they should cut enough to carry them over several years. The hay should be stacked and covered well, not making the stack too wide, as that might result in the wet getting in badly. When the hay was coarse and rank it was necessary to chaff it, and other fodders could be mixed with it. As much wheaten chaff should be saved as possible. Over stocking should be avoided, as a good paddock to turn the horses in saved stable feed.

ECONOMY OF TIME.—Mr. McCallum read a paper on this subject:—“It was astonishing how much could be done by using up the stray moments. The farmer should have a set time to rise in the morning, remembering that one hour gained in the morning all the year round would be equal to another month in the year. On the other other hand he must allow himself enough sleep. The day's work should be planned, so that there would be no delay in going straight to work. His plan was to map out the day's work the night before, or the first thing in the morning. He always found that horses could do more if worked regularly each day than with one big day's work and the next day only half as much. Many would say it was impossible to have the work of each day planned out to be done at a certain time. No doubt, at certain seasons of the year it would be rather difficult, but the farmer lost much of his time by working out of season; the four seasons of the year should be clearly planned out and a right quantity of work for each season. How often one met with farmers who never observed the seasons. They went on working out of season month after month and year after year, and the consequence was they were only getting half paid for their labor. First in importance was the harvest season, commencing with the hay harvest. All machinery, binder twine, oil, &c., should be on hand and in good order to enable the farmer to go straight to work without loss of time. It was equally important at seeding time to have all things in perfect order, so as to make the most of time; for when the land was in a good condition for the grain to germinate straight away it often resulted in the yield of a bushel or two more per acre at harvest time than if sown under less favorable conditions. In the fallowing season every day lost when the team was standing idle was telling on the next harvest. It was important to have a right quantity of land planned out to fallow and horse power equal to accomplish the work at the right time. He found a diary a great help, and could always look back and see what quantity of ground was fallowed during past seasons, thus helping to arrange for and plan out the coming season. Throughout this season many farmers failed to make the most of their time. Some neglected to start fallowing at the right time, others had not horse strength enough to fallow the quantity of ground they had planned out, and

thus they continued to extend the fallow land when they ought to be working over the part first fallowed, giving it a fine surface for the summer. The season between harvest and seeding time should be spent in various ways, such as making improvements on the farm, providing water supplies, fencing, refencing, &c., and overhauling implements for repairs."

Quorn, August 28.

(Average annual rainfall, 13½in.)

PRESENT—Messrs. Thompson (chair), Twopenny, Noll, Cook, Schulze, Salmon, Mattner, Brewster, Patten (Hon. Sec.), and one visitor.

ENSILAGE.—Mr. Noll asked if it was the intention of members to make ensilage this year, in view of the probable heavy growth. He intended to do so. Mr. Salmon considered that stack ensilage could be made on the ground surface like hay by weighting it down with railway irons. Mr. Schulze preferred a pit, and pointed out that there was a lot of waste with stack ensilage, as the air penetrated some distance from the outside. The Chairman thought a cheap silo could be made by putting upright posts in a circle and nailing black iron on the inside. Mr. Gleeson considered ensilage a great help to the dairy farmer in the north.

EARLY WHEAT.—Mr. Mattner tabled a sample of wheat which was over 3ft. high and not yet in ear. It was grown at Mr. Altman's farm, in the hundred of Palmer.

EGG CIRCLES.—Members considered this district was too scattered for the satisfactory working of an egg circle.

Wepowie, September 7.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Halliday (chair), Gale, Crocker, Chrystall, Coad, Pearce, Fuller, and Orrock (Hon. Sec.).

CABBAGE BLIGHT.—Mr. Crocker read a short paper on blight on cabbage. This insect would attack cabbages at any time from planting till fit for use. A good remedy was to sprinkle a little superphosphate over the affected plants, taking care to put it well into any folds or crevices where the blight was found. All old cabbage stumps should be pulled out of the ground, and when cleared it should have a good coating of super, sprinkled over and dug in. This remedy would also apply to turnips and other vegetables affected by the same trouble.

Wirrabara, August 28.

(Average annual rainfall, 30in.)

PRESENT—Messrs. Curnow (chair), W., W. H., and E. J. Stevens, H. E., A., and G. Woodlands, F. and R. Passow, Hoskins, E. and C. Hollett, Marner, Pitman, Lawson (Hon. Sec.), and two visitors.

BEST WHEATS FOR DISTRICT.—Mr. C. Hollett read a paper on this subject. Not many years ago 14bush. per acre was considered a good yield in this district, but now the farmer expected anything from 20bush. to 30bush. This difference could not be entirely accounted for by the better rainfall, nor wholly by the use of superphosphates, though this last was undoubtedly largely responsible. A great advance had been made by the production and introduction of new varieties of wheat which had proved their superiority over many of those formerly grown. Among them might be mentioned Gluyas, Petatz Surprise, Gallant, Rattling Jack, Steinweidel, and many other varieties. The best wheats for this district were, in his opinion, Federation and Yandilla King. After these he would place Marshall's No. 3, Silver King, and Phyllis Marvel. Federation had been with him the best yielder; it withstood dry spells well, was a good grower and a good threshing wheat. While Yandilla King was a good yielder, like Marshall's No. 3, it was tough to thresh, and so caused loss of time. For hay, he recommended Baroota Wonder and White Tuscan. They grew fairly tall, and if not left too long had a good color. Sowing an early and a late variety together also gave good hay. The early gave the corn and the late variety the color. When cut into chaff it looked well and sold readily. He recommended a frequent change of seed wheat, procuring it from other districts. Neglect of this often resulted in failure of crops. In the discussion which followed Purple Straw was mentioned as a good hay wheat, in addition to the two varieties previously named. One of the characteristics of Federation was that it did not shake out as some other wheats did.

MIDDLE-NORTH DISTRICT. (PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, September 1.

PRESENT—Messrs. Fradd (chair), Bird, Curtain, Joyce, Jacobie, J. J. and J. A. Ryan, Woolford, Burton, A. and F. Bartrum, Woods, Murphy (Hon. Sec.), and one visitor.

PURCHASING FARM MACHINERY.—Mr. A. Bartrum read a paper on this subject. One of the most important points to consider when purchasing machinery was the durability of the working parts. Bearings which were quickly worn and frequently needed renewing caused a great deal of loss of time and money. It was usually the case too, that machinery gave way just in the busiest time, when the arrest of farming operations resulted in loss in many ways. He preferred colonial made machinery if it could be secured suitable to the work to be done, and where possible would purchase direct from the maker. If it was necessary to purchase through an agent he advocated transacting all business in writing. Care should be taken to see that all was quite correct before signing anything. Want of care in this direction might result in a harvester being sent out with some little thing missing—such as leather on the pulleys. He believed in having field trials, and thought it would be well for Branches in a given district to unite in arranging good trials. Makers could then see where improvements were needed, and prospective buyers would be able to judge as to the best machine for their requirements. Co-operation in the purchase of machinery he did not think would work, unless it was for sheep shearing, manure spreading, or seed grading. Members considered that field trials were not always a sure guide for farmers to go by when purchasing, as machines which were apparently alike did not always work alike, and they feared the same workmanship was not always put into machines for sale that was devoted to those for trials. It was thought more satisfactory to obtain a guarantee when purchasing, and to give the implement a fair trial before paying a deposit. Members were agreed that co-operation in purchasing farm machinery would be difficult to arrange satisfactorily.

RING-BARKING CHERRY TREES.—In answer to a question members were not in favor of ring-barking cherry trees to make the fruit set, several had tried it with unsatisfactory results. Root-pruning was recommended for this purpose.

Belalie North, August 28.

(Average annual rainfall, 16½ in.)

PRESENT—Messrs. Warner (chair), Tremlett, Atkins, O'Neil, Cummings, Waldhutter, and five visitors.

EXTERMINATION OF FOXES.—In accordance with a request in the *Journal*, this question was well discussed. The Branch formally decided to support any endeavor to exterminate this pest, and considered that all Branches should co-operate to bring about that result.

SOIL ANALYSIS.—Mr. Tremlett wished to know if soil could be analysed, to ascertain the fertiliser required in any special case. [While an analysis will show what chemical constituents are present in a sample of soil, it will not reveal whether those constituents are in a form in which they are available to the plants. The only way therefore to find out what fertilisers are best suited to the soil is to experiment with several plots. It is necessary to harvest the plots separately and carefully weigh the results, if accurate knowledge is to be obtained.—E.B.]

Brinkworth, August 10.

(Average annual rainfall, 14½ in.)

PRESENT—Messrs. Davis (chair), Stott, Brinkworth, Hawker, Wundke, Horrocks, and Hill (Hon. Sec.).

CO-OPERATIVE MACHINE-SHEARING.—Discussion on this subject took place. Mr. Horrocks pointed out the advantage of being able to do away with star lots by co-operation. A larger clip of well-classed wool would attract the attention of the larger buyers, and it would pay in this way to have a woolclasser, and have the wool put up in bales to the best advantage of both buyer and seller. Mr. Davis considered that co-operation in shearing would do away with the labor trouble often experienced by small farmers, and by having the sheep of a district shorn at one depot the cost would be reduced to a minimum.

Caltowie, August 30.

(Average annual rainfall, 17in.)

PRESENT.—MESSRS. N. Hewett (chair), H. and L. Graham, J. and G. Lehmann, E. Hewett, Petatz, Royal, Neate, Collins, Batten, Kitson, Moore, and F. Lehmann (Hon. Sec.).

IMPROVED CULTIVATION.—Mr. Neate read a paper on this subject to the following effect :—“ In view of the unprecedented prosperity which South Australia had experienced during the last few years it might be thought that farmers generally had taken advantage of every opportunity to make their farms as productive as possible. This prosperity was not due only to good seasons, but also to improved methods of cultivation adopted by the farmers in the production of their crops. South Australia, on a *per capita* basis, was easily first in the Commonwealth as a grower of cereals, and it was doubtful if there was any other country in the world where the cost of producing wheat was so low. These were pleasant facts, and served to illustrate the remarkable expansion made by the State in agricultural matters. Apart, however, from wheat-growing he questioned whether farmers generally were deriving the maximum amount of profit from industries which were carried on in connection with farming, such as dairying, poultry-keeping, lamb-raising, &c. It must be admitted that more might be done in this direction, although these industries must of necessity be considered of secondary importance on the average farm. No sane man would think of sacrificing the time and attention which was required for wheat-growing in order to attend to the smaller items ; but, at the same time, these industries if attended to would add materially to the farmers' income. Nearly every farmer kept a few cows for the purpose of providing milk and butter for the household, and perhaps he had a few pounds to sell ; but if asked whether they paid for their keep he would probably say he did not know. They were kept because it was very convenient to have the milk and a few pounds of butter to sell, and so long as this convenience was met without much care the average farmer was satisfied. It seldom appealed to such a man that it would pay, even if he only wished to keep two or three cows, to keep the best milkers and feed them well. To keep up the milk supply and good health during the summer months cows needed a supply of green feed ; but how many, he asked, ever attempted to grow it. The consequence was that when butter was a good price the cow was in a comparatively profitless condition. The same indifferent spirit applied to poultry-keeping. It was no uncommon thing even to-day to find farmers keeping poultry of various breeds and ages all mixed up together and having the whole run of the farmyard. Under circumstances of this kind it was impossible to make poultry-keeping a profitable undertaking. If a farmer wished to keep poultry he should be prepared to devote a little time at any rate to their care ; and if he wished to make the most of them it was essential that he should procure the best laying strains possible, and keep them in a place to themselves. If this were done it was possible to judge which was the most profitable class of fowl to keep, and whether they paid for the feed and the attention bestowed upon them. In lamb-raising for export there was a good profit to be made, providing the farmer adopted the right course of action. The majority of those who kept sheep had in a small way attempted to breed a few lambs for export. What provision had they made on the whole for making this a sure and profitable enterprise ? With the exception of a few isolated instances, where farmers had grown fodder crops for the purpose of fattening lambs, little had been done. A good many had gone in for crossing in order to produce a more suitable class of lamb, which would thrive on natural pasture ; but the most important matter of all, namely, that of providing sufficient feed to top them up, had been sadly neglected. The average farmer bred the lambs and trusted to the season to do the rest. Consequently, if the season was late in opening, the natural pastures as a rule were not sufficient to bring the lambs to maturity as quickly as should be. The importance of cultivating a few acres of fodder in order to give them that fresh and uniform appearance so essential for freezing must be recognised. He was not in a position to advocate any hard and fast lines as to what crops should be grown for this purpose. What did well in one district might not give the same good results in another ; but he believed rape or peas would do fairly well in most places. Since the success and development of this and every other trade depended upon the products being of prime quality, it was imperative that something should be done to guard against the ‘reject,’ a term which too often had to be applied to lambs produced for export.” Members generally agreed with the paper, but it was considered by some that the great drawback on many farms was the difficulty of procuring suitable and permanent labor, without which it was almost impossible to do much in many important directions,

Mount Bryan, August 30.

(Average annual rainfall, 15½ in.)

PRESENT—Messrs. Hatherley (chair), Kelly, Wardle, Beckwith, Trallaggan, Dunstan, Gregurke, E., H., and A. Collins (Hon. Sec.), and one visitor.

BUREAU WORK.—Mr. Beckwith read a paper in which he emphasized the necessity for regular attendance. Each member should contribute something of interest during the year. If they could not write a paper, they could introduce some practical subject for discussion. The results of experiments carried out by members, no matter how small, should be made known to the whole Branch, and all could cut out any newspaper extract that was of more than usual interest, so that the matter might be talked over at the meetings.

Mundoora, September 3.

(Average annual rainfall, 14 in.)

PRESENT—Messrs. Dolling (chair), Owen, Button, Dick, Arbon, J. H. and W. J. Shearer (Hon. Sec.).

ANNUAL MEETING.—The business of the annual meeting was transacted on this occasion, the wet weather having made it impracticable to hold the meeting on the date fixed. The Hon. Secretary reported that the average attendance had been 11 members for each meeting.

TAKEALL.—The Chairman reported the appearance of patches of takeall. Members thought that these patches were due to the excessively wet season, rather than to takeall.

THE SEASON'S PROSPECTS.—To the present date this is one of the finest seasons experienced in this district. In spite of the continuous rain, growth of wheat and feed is considered excellent.

Narridy, September 4.

(Average annual rainfall, 16½ in.)

PRESENT—Messrs. Haren (chair), Satchell, Nicholson, Black, E. and P. Smart, Darley, Lang, Liddle, Hodges, Freebairn, and Kelly (Hon. Sec.).

TRAVELLING AGENTS.—The Hon. Secretary read a paper on this subject to the following effect:—"All firms had agents travelling through the country, and the expense attached to them was no small item. As the purchaser had to pay these expenses, he considered they were quite justified in endeavoring to deal direct with the manufacturers or importing firms. Agents called at most farms with great frequency to try to persuade the owner to purchase their particular fertilisers, and when they had the order appeared to trouble no further as to whether the right weight was delivered in each bag or not. Why could farmers not order fertilisers direct from the firms, and demand that it should be weighed before taking delivery of it? When it arrived at the station it could be looked after in just the same way as any other consignment. Binder twine, he considered, should be purchased in the same way. He would also ask why farmers should not order implements direct from the maker or importing firm. They had to send an expert to start machines and implements, while the travelling agents knew nothing more about them than they saw on paper. He did not think the travelling agents really sold 5 per cent. of the implements they handled, as most farmers knew what they required and were going to purchase, and unless easily led, took little notice of an hour or two of talk of the travelling agent. By ordering direct from the maker or importer they should be able to procure the article at 12 per cent. to 15 per cent. below the cost when purchased through the medium of an agent. He thought it would be a good thing to dispense with the agents, and although some might say that dealing direct with the firms would make it difficult to get any small parts, if the implement was worth using the small parts would be stocked by the local tradesmen, such as blacksmiths, storekeepers, saddlers, etc. There were also a few agents who did all they could to get their bread buttered on both sides. Farmers should not deal with such a man on any account. In conclusion he thought that if farmers would co-operate more, and order only from firms as described, they would get a cheaper market to purchase in, and a better one to sell in. He thought there should be a union to which all farmers should belong, to protect their interests." In the discussion which followed, members were divided in opinion as to whether it was practicable and wise to try to dispense with the agents altogether. Mr. Darley thought

if all farmers joined the existing S.A. Farmers' Co-operative Union they would get along a great deal better. Others did not think the Union was worked on proper lines. Mr. Lang advocated more field trials of implements, with judges elected by public voting. This would insure having a judge who had an adequate knowledge of implements. Mr. Satchell thought that all agents should be experts, and know how to put an implement together and start it working.

Port Pirie, August 26.

(Average annual rainfall, 12 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Hawkins (chair), Johns, Wilson, Bell, Finnigan, Munday, Birks, McEwin, Stanley, Wright (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This being a homestead meeting much of the time was spent inspecting Mr. Munday's up-to-date and well-kept homestead. He had 900 acres of land which he worked on the three-course system. A well-kept vegetable garden containing a number of varieties of vegetables was much admired by the members. The wheat crops were looking well at the time of the visit. Some fine stumps of horses were grazing on barley which had been sown for this purpose, and their partiality for the barley in preference to the natural herbage was amply proved by the fact that the barley was eaten off close to the ground, while the grass and wild oats in the same paddock was left growing unchecked. A thoroughness in every detail was noticeable on the farm. The members and their wives were entertained by Mr. and Mrs. Munday, who were suitably thanked.

FARM MANAGEMENT.—Mr. Munday read a paper on this subject as follows:—"In dealing with the subject of farm management it will not be wise to adhere to any hard-and-fast rule, seeing much of the success or otherwise will depend to a great extent upon the character of operations to be carried out. Locality, characteristics of soil, annual amount of rainfall, nearness or otherwise to markets are factors which will determine, to a large extent, the successful working of the farm. In view of the increased cost of careful cultivation, combined with the high prices of modern up-to-date agricultural machinery, not to mention the high rates of suitable labor, it becomes almost imperative that the area of the farm should be a fairly large one. A farm of 900 acres or thereabouts will allow what is known as the three-course system to be carried out, namely, pasture, fallow, and grain, a system which over an extended period will prove the most profitable, although there are many farmers to-day who prefer to crop every year. I admit, while the price of wheat is high, there is some excuse for the latter practice as against the three-course system; but to crop every other year necessitates the removal, by fire or otherwise, of the stubbles from the previous crop to enable the soil to be thoroughly cultivated, thereby removing one of the principal elements necessary to the soil, namely, organic matter, which, with the droppings from the stock, help to supply this want. Then again, less stock must be kept where the land is cropped every other year—a result which is not desirable in view of the comparatively high price ruling at the present time for all classes of farm stock. One of the first steps necessary will be to enclose the farm with a good strong post and wire fence composed of not less than six wires (seven for preference), capable of resisting the trespass of cattle or sheep, and, if practicable, further subdivided into fields of about 100 acres each. This extensive fencing will allow a proper course of rotation to be carried out, besides enabling the pasture lands to be used to the best advantage. Each field should have proper means of access in the shape of gates. The cost of good strong gates is not prohibitive, and if given a coat of paint occasionally they will last a considerable time. Care must be taken to ensure an adequate supply of pure and wholesome water, both for domestic and stock requirements. I am convinced much of the trouble and sickness amongst our farm animals is brought about by the pollution of the water supp'y, and this should be guarded against. The homestead should be situated in as central a position as possible; the stable should be thoroughly ventilated, and the sheds made waterproof to protect the machinery. To economically carry out the work of the farm of 900 acres or thereabouts will require at least 16 draught horses, as well as two or more light ones, and the class of animal most suitable is the compact nuggety horse, with plenty of bone and muscle. Amongst the horses required for the farm should be a few good mares for breeding purposes, with a view to the rearing of a few foals each year to replace aged or otherwise unfit animals. The sire of the foals must be thoroughly sound and otherwise suited for the purpose required. Proper attention must be paid to the rearing of the foals after weaning. When taken from the mares at about six months old it should be supplied with plenty of good nourishing food, such as bran, oats, and good sound hay, with a little salt added occasionally. Apart from the horse stock required for working a farm of this area, a small flock of about three or four hundred sheep may

be kept, providing the soil be of an average character and suitable for the purpose. The class of sheep likely to prove the most profitable is the Merino of large frame, a good strong robust type, the wool of which, while perhaps not bringing quite so much per pound as wool of a finer type, will more than compensate by the density and heavier weight of fleece; also, this type of sheep crossed with Shropshire and Leicester rams will prove suitable for the rearing of lambs for the export trade; but great care must be taken to see that the farm is suited to the rearing of fat lambs, otherwise failure is certain; and in any case care must be taken not to overstock. It is necessary to supplement the natural pastures by growing such fodders as barley, oats, rape, and mustard where conditions are favorable. A portion of the stubble land may be profitably used for this purpose. Drilled in with super. after the early rain in autumn this will ensure early and abundant fodder, both for ewe and lamb. Where cows are kept a certain amount of income will be derived by keeping pigs. Profits from poultry will be no small consideration when intelligently and carefully looked after; in fact the poultry industry, if properly developed, will prove one of the most profitable lines on the farm. The implements used should be of such a character as to combine lightness of draught, consistent with strength and durability, as well as to economise labor; as much of the success of present-day farming depends upon the rapidity with which the various operations of the farm may be carried out. Valuable machinery when not in use should be properly housed from the weather, care being taken to repair all breakages before putting away, with a view to having same in thorough going order when required—saving time at perhaps the most critical period of farming operations. Fallowing is one of the most important matters of the farm, and should be commenced immediately after seeding. The depth of ploughing must be determined by the character of the soil. On heavy clay soil a fair depth may be profitable, but where the land is of a sandy character shallower ploughing will be found more suitable. Great care must be exercised in dealing with this class of land in the after cultivation. Beyond lightly working it to destroy weeds it will not be wise to reduce to too fine a tilth, owing to its liability to drift. To ensure proper germination of seed, and to allow the seeds of weeds to germinate, it will be wise to wait until sufficient time has elapsed after rain has fallen in March or April before commencing to sow, especially does this apply since the use of phosphates has become universal. It is better to wait until the soil is in a proper condition to receive the seed than to have the crop over-run with weeds. In selecting the variety of seed to sow the farmer must be guided to a certain extent by the question of locality and soil; but, speaking generally, in the varieties of Carmichael's Eclipse, Gluyas Early, Federation, Yandillah King, Pratt's Comeback, Marshall's No. 3 we have a choice recognised suitable for most of our northern areas. The three former varieties are good all-round early wheats, while the latter are good medium or later wheat, well-adapted both for wheat or hay. I think as early as possible after the blossom has dropped is a good time to cut for hay. For hay I recommend that a fair portion of the land in crop be sown to oats expressly for hay and grain. Oaten hay and grain is best for working stock, or a mixture of good wheaten and oaten hay chaffed together makes excellent feed for heavy work. If Algerian oats are sown for hay, care must be taken that they are not cut too early, but allowed to partly mature, otherwise the stock will not take readily to it. When the stalk of the plant shows a purple and yellow tinge is a good time to cut for hay. After the hay has properly dried, the quicker it is carted and stacked the better it will be. The farmer will, if he is wise, protect the stacks from rain and vermin as early as possible after erection by having them thatched, or covered by other means, thus preventing a large amount of waste later on by rain and vermin. The harvester should be started as soon as the grain will safely allow of its being bagged without risk of heating. This point must be carefully noted to avoid trouble later in the marketing of the grain."

Whyte-Yarcowie, August 28.

(Average annual rainfall, 13½ in.)

PRESENT—Messrs. Pearce (chair), G. D. and G. R. Mudge, J. E. and W. Hunt, McLeod, Moss, A. and F. Mitchell, Jenkins, and Lock (Hon. Sec.).

SHEEP AND WOOL.—A paper on this subject was read by the Hon. Secretary to the following effect:—It was generally accepted that a farm was not complete without a few sheep, and all were acquainted with the benefits to be derived therefrom. The two main sources of profit were the wool and the lamb, but they could not get the best out of both together. They should go in for the best sheep obtainable, and the best for this district was undoubtedly the large-framed, strong-woollen Merino. For the farmer who could only keep a few sheep, the majority should be breeding ewes, for in them he had three

sources of profit, viz., the wool, the lamb, and in the end the carcass. It should be remembered that it took no more to keep a good sheep than an inferior one. To get the best results from them it was absolutely necessary not to overstock, as partial starvation at any time of the year would affect the growth of wool; and if sheep were ill cared for the best woolled sheep would be little better than the inferior. Provided the fences were good, sheep required little attention, and were best left alone as much as possible. It was an advantage to change them to different paddocks frequently, both as regards the sheep, which liked a change, and also the feed. For this reason paddocks should be reasonably small, and the partition fences good. In buying sheep they should get them off somewhat similar country to their own, and should get them young—two years, if possible—and as they became old dispose of them; for it did not pay to keep old sheep. The old sheep could be replaced by buying more, or by selecting the best ewe lambs from year to year. This latter method had many points in its favor, but needed care and attention. The aim of every farmer who would obtain the best results should be to keep as even a quality as possible, as this would count for much in the get-up of the clip. Whatever the breed of ram used they should not be too old, as they needed to be vigorous. For the best results, great care was needed in selecting the ram, as he was to leave his mark on a number. The ewe was of great consequence, but the ram greater still; and this was not the place for economising, for a penny saved might be a pound lost. For Merino, the large-framed, strong, greasy-woollen ram, other things being equal, would give the best results. The practice of leaving the ram with the ewes all the year round was, in his opinion, bad. It might sometimes be profitable, but more often was not. It was greatly to the advantage of both ewe and lamb at weaning time if there was plenty of good succulent green feed. From April to June was the best time for lambing in this district. The popular lamb was the crossbred, and it was undoubtedly the best for export purposes. It was more shapely, cut up better, and under favorable circumstances matured earlier; but in country such as this, with its cold, sometimes dry, winters and consequent scarcity of feed, the pure Merino was the safest to breed. With good feed they came along well, realised almost as good prices as the crossbred, and, if the season was unfavorable, they could be held over to better advantage. In the best of seasons there were almost sure to be some crossbred lambs not fit for market, which had to be held over—sometimes owing to misadventure, and sometimes to bad mothers. These should never be kept for breeding purposes, but should be disposed of at the first opportunity; and the bad mothers—if possible—marked and disposed of also. With small lots of wool, classing to any great extent was out of the question; but every care should be taken to get the wool up to the best advantage. All stained parts should be removed, but heavy skirting was not advisable. The only classing practicable was to keep out the tender fleeces, the extra greasy, and the discolored, and, of course, keep Merino and crossbred separate. The fleeces should be carefully rolled and placed in bales. It was a mistake to mix bales, such as part fleece and part pieces, even though these were kept separate, as they were sold together and would bring little more than the price of the inferior class. He recommended them to avoid “star lots,” or less than four bales of one class, as much as possible, as there was considerably less competition for these. The time was coming when it would be very difficult to get hand shearers. All the big sheds were going in for the machines; the blades were going out of date, and the farmer would have to accommodate himself to the machines also. To this end the idea of co-operative sheds was the best thing he knew of. Even though they continued the use of the blades, there were many advantages to be gained in this way. As it was at present, each farmer had to prepare a shed, which was generally used for other purposes during the year, and therefore unlikely to be suitable for keeping the wool clean and thereby securing the best results. Then, too, he employed one or two shearers who were often not the best of workmen, and both sheep and wool suffered. It took perhaps a week or more to complete the job, and probably delays were caused by rain, during which time the farmer had to provide for the extra men. Few farmers had the necessary materials to properly treat the wool—probably the table was an inferior makeshift, the clearing stand was poor, and many other inconveniences had to be put up with which all knew only too well. Under those circumstances it was not overstepping the mark to say that their sheep cost them 4½d. per head directly, and, all things considered, the total cost would be more, and even then the best results could not be obtained. Sometime since a firm offered to rent any suitable shed in any district if the number of sheep was sufficient, to provide all necessary labor and plant at a cost of from 6½d. to 7½d. per head. At first thought the price, together with the outlay of capital necessary to provide the shed, seemed exorbitant, and more expensive than under the present circumstances; yet, considering the better facilities provided for treating the fleece, resulting probably in a ½d. or ¼d. increase per pound in the price of the wool, they

would see that in the end it would probably be the cheapest. There were also other advantages to be gained in saving of time, as shearing each flock would only take a day or two. There would be much less handling of the sheep, which would be a great advantage, especially to ewes and lambs. The housewife would not be inconvenienced with the extra cooking, &c., and if the depot was near the railway there would be less trouble in carting the wool. He would not favor further co-operation in packing and selling—although this would undoubtedly enhance the value of the whole—as it would lead to much dissatisfaction. It was human nature to see more in their own than others could, and more, probably, than there was, and would be likely to break up what otherwise would be a good working scheme. He believed they needed much more co-operation amongst farmers than at present existed, but they also needed to be educated up to it, and therefore it would be inadvisable at present to launch into the bigger scheme.

Yongala Vale, August 27.

(Average annual rainfall, 13½ in.)

PRESENT—Messrs. Battersby (chair), F. and H. Miller, Chigwidden, Marshall, Jamieson, Laubsch, Fowler, Cooper, Schmidt (Hon. Sec.), and four visitors.

DISEASES OF STOCK.—Mr. Battersby introduced this subject. The health of a farmer's horses depended on the attention given to them. They should have good clean stables, free from draught. An occasional dose of condition powder was beneficial to their health. He recommended members to keep a supply of aconite, belladonna, nitre, and oil of juniper on hand, being drugs that would treat most of the minor ailments. He also suggested that this Branch should obtain the necessary instruments for treating horses, so that members could have the use of them when needed. Much interest was displayed in the discussion. Members generally favored the drenching horn, but were divided in opinion as to whether the Branch should obtain instruments or a reliable book on diseases of stock. The need for proper attention to the collars of horses, and care not to overwork them, was generally acknowledged, whilst the practice of feeding horses out of old iron tanks was condemned by all. Members agreed that it was not always an easy task to determine the disease of a horse. A mixture of laudanum and sulphuric ether, 1oz. of each, was recommended as a reliable and speedy cure for colic.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, September 4.

(Average annual rainfall, 21½ in.)

PRESENT—Messrs. Stevens (chair), Friend, Waters, Sibley, Salter, Plush, Ball, Wishart, Smith, Swann, Matthews (Hon. Sec.), and one visitor.

ARSENICAL SPRAYS.—Members decided to support the efforts being made to regulate the sale of arsenical sprays and to insure that they contain the percentage of arsenic guaranteed.

ORCHARD MANAGEMENT.—A paper on this subject was read by Mr. Friend as follows:—Fruit-growing for profit is a trade or business, and to obtain the highest measure of success the orchard must be made to produce the utmost fruit at a minimum of cost. Thorough cultivation, cleanliness, systematic pruning, and constant care as regards vegetation diseases are absolutely necessary. Judgment is needed in the matter of the varieties and crops to be grown. Large quantities of inferior fruit cannot be disposed of at satisfactory prices, neither is it profitable for an orchardist to have among his few trees many varieties. In starting an orchard one of the most important things to be considered is

the soil, subsoil, and situation. Being free to choose, I would select an alluvial soil, having a sandy tendency, with a good deep subsoil—a soil the plough could be put in at any time without harm. I would plant on an eastern slope, as in such a position you get the early morning sun, the frost is never so severe, and the hill will somewhat protect it from the prevailing westerly winds. New land of any character should be fallowed deeply, and deep cultivation carried on through the summer to destroy weeds and to promote a friable condition of the soil. As planting-time draws near plough again as deeply as possible. This can be done by using two single-furrow ploughs, one without its mouldboard following in the furrow of the other one, stirring the soil 12in. or more in depth. When the ground is properly prepared, line out for planting. Difficulty is often experienced when setting out an orchard in keeping the rows straight. A well laid out orchard, with the trees in perfect line, presents no difficulty or risk of damage at ploughing time; but when out of line the branches greatly interfere with this operation. There is nothing looks worse in an orchard than to see it slovenly and carelessly planted and the trees all out of line. It is therefore very important that the trees be set exactly in line. In order to accomplish this, use a piece of fine galvanized wire the length of the block of ground you intend to plant, use an iron peg at each end for fastening to the ground, then all along this piece of wire, at the distance apart you intend planting your trees, twist on a piece of wire. [If a little solder is dropped on, these marks are not likely to shift.—ED.] When the piece of ground has been squared off, and the required distance taken from the fence or boundary, place the wire across the ground, and at each mark place a stake where the tree is to go. After the holes have been dug, bring back the wire and plant the tree at each mark. July and August are the best months to plant in this district. The best distance apart to plant is 20ft. or 22ft. each way. The holes ought to be all dug ready before beginning to plant. At the bottom of the hole throw in two or three handfuls of bonedust, then loosen up the soil with a pick or spade. Be careful not to place the bonedust on the roots. When planting, fill in the hole to the required depth for planting. Plant the tree on a mound in the centre of the hole, to allow the ends of the roots to go down deeper; put it in upright and about as deep as it was in the nursery; spread the roots out carefully, putting some of the best soil on them, and tramp it down firmly before the hole is quite full, then add the rest of the soil, leaving the surface loose. It is advisable, as far as possible, to plant each variety in separate blocks, as it is better for picking, pruning, or spraying. When planted, prune the trees hard back; about 16in. is a good useful length to sever the stem to frame sturdy trees. The following year, if the tree has been framed, select about three strong firm branches that radiate at equal degrees, cut them back to four or five buds to form the main arms; this will avoid the formation of weakly forks. The following is a list of a few of the most suitable trees for planting for commercial purposes. Do not plant a large number of varieties but confine your attention to a few of each class. *Apples*—Cleopatra, Jonathan, Rome Beauty, Dunn's Seedling; *Apricots*—Moorpark; *Pears*—William's Bon Chretien (known locally as Duchess), Glou Moreau (known as late Duchess); *Plums*—Coe's Golden Drop, French Prune, and Jefferson; *Pearches*—Salwey, Early Crawford, Lady Palmerston, Muir, Foster, Elberta. I believe in ploughing the orchard twice a year; the first time as soon as the ground is workable and the weeds have started to grow. Leave the ground, after it is ploughed, in the rough state, as it will give the rain a better chance of penetrating the soil. The second ploughing should be commenced in August. Striking out should be done with a single-furrow plough, drawn by a good steady horse; use leather traces and short swing or spreader about 18in. long. Turn the headpiece so that the longest part is on the left side of the plough, or use an extension headpiece for very wide trees. A light plough with long movable handles is the best for this, as it is easier to work in and out as it passes the trees. I strike out two furrows with the single and then follow with the double-furrow plough, drawn by two horses, allowing both horses to walk out of the furrow the first round. I have the headpiece made extra wide for that purpose. Strike out at every other row and finish at the row between. A plough that is good for striking out is good for finishing off. To set your plough for finishing, take off the little wheel and the standard, then lift the big wheel, which will let the plough lean to the off side. It is better to use a new share in finishing, as it will grip better, especially on sideling ground, and will go into any hard patches. Remove the coulter when finishing off, in case there is any grass or stones which are likely to choke it and cause the plough to slip out of the ground. The depth to plough should be according to the nature of the soil; 4in. or 5in. is a reasonable depth. When the ploughing is finished start cultivating, crossing the ploughing, to cut away the strips and level the crowns left by the plough. After every useful rain during the dry months the cultivator should be put to work to move the surface, which then acts like a mulch and retards evaporation.

Clare, August 27.

(Average annual rainfall, 24in.)

PRESENT—Messrs. J. C. McCarthy, Kollo sche, Daly, J. H. Knappstein, McKenzie, Pryor, Kelly, Berridge, and P. Knappstein (Hon. Sec.).

FARM ECONOMY.—The following paper, by Mr. Pascoe, on this subject was read:—Every farmer, if he wished to be successful, should endeavor to economise in every department on his farm. He disliked to see mangers half full of hay with very little more than the heads eaten off after the horses had gone out in the morning. This was caused by giving the horses more hay than was needed, and the hay left in the manger had to be thrown out under the horses' feet. If a little more care were taken, and the horses given less, they would clean the manger out, and would practically be the saving of hundreds of sheaves in the course of a year. Another important matter was to take care of the harness. It was false economy to let it get out of repair and have it tied up with a piece of wire or binder twine, rather than spend a few shillings at the saddler's. It should be kept in good repair, with a good application of oil, well rubbed in twice a year at least. The harness would last twice as long, and with good harness the farmer was less likely to have serious accidents, for in numerous cases bolts and accidents with horses were caused through the reins or some other parts of the harness breaking, and horses were less likely to get sore shoulders. All machinery when finished with at the end of the season should be placed in a shed, sheltered from either sun or rain. Repairs needed should be noted, so that on wet days they might be attended to, and the machinery placed in order ready for the coming season. As a rule men would rather be working on wet days than loafing around, so when it was impossible to do work in the fields repairing might well be done. It was a bad plan to use too much fencing wire on machinery. A piece was often put in on an emergency in place of a bolt or clamp lost. This should be taken off next day, and the proper repair made. An occasional coat of paint was a good thing to preserve machinery, especially in the case of a machine where wood formed a part. Another economy could be carried out in keeping fences in order. Every farmer knew that if a wire or two got broken in a fence and was left it was not long before a post was also broken through the stock passing in and out, and in a very short time that part of the fence was ruined. There was a great saving in time and expense if a blacksmith's forge was kept on a farm. Here, again, there was work for wet days, such as sharpening harrow tines, and many other small jobs which a farmer could well do himself. He found that by growing a few acres of oats he made a great saving of bran and pollard, and after the oat crop was reaped he at once put on the binder, and cut the straw and stacked it. Oat straw, chaffed with hay in the proportion of half straw and half hay, mixed with a little bran, made a splendid feed for the milking cows in cold weather. They ate it readily, and as much as was given them; and in the slack time, when horses were not working, they would eat the chaffed straw and hay with relish. He had noticed, too, that stock would eat oat stubble in preference to wheat stubble, so that from many standpoints the sowing of oats was a good investment.

DEEP PLOUGHING.—Mr. E. Kelly wished to know which was best, to plough deep or shallow. Members were of the opinion that deep ploughing where practicable was the most beneficial in this district.

Freeling, September 10.(Average annual rainfall, 17 $\frac{3}{4}$ in.)

PRESENT—Messrs. J. A. Mattiske (chair), Heinrich, Koch, Wehr, Bailey, A. and G. T. Elix, Nenke, Neldner, H. and J. A. Mattiske, jun., Schuster, Shanahan, Kleimig, Block (Hon. Sec.), and one visitor.

INCREASED PRODUCTION.—Mr. Heinrich read a paper dealing with the question of greater production in this State. He considered that more attention should be given to the selection of seed and the breeding and raising of the right class of stock. The seed should be hand-picked in the first instance, selecting the best heads from a crop of a good variety. Selecting again from year to year was the only way to keep the quality up to a high standard and to improve the yield. The extra work entailed in doing this would be amply repaid. Every farmer who kept live stock should endeavor to improve the quality by judicious breeding. Some of the following experiments, he thought, might well be made, viz.:—Early summer fallow, planted with peas later, and when in flower ploughed in to supply nitrogenous matter for the succeeding crops. Sow and cultivate seed for stock, instead of relying upon what would grow from self-sown seed. By this

means a much larger number of stock could be kept on a smaller area of land with better results. In the discussion which followed, rape was mentioned as a good early green feed. Some members thought that, as it would be a difficult matter to plough in peas in this district, it would be better to harvest them, as they made a valuable feed for cows and sheep.

Mallala, September 6.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. A. Marshman (chair), G. Marshman, A. V. and J. Nairn, Pitt, McCabe, Temby, and T. Nevin (Hon. Sec.).

STANDARD WHEAT SACK.—Mr. J. Nairn read a paper on the question of the size of wheat sacks as follows:—In order to be successful in this age of competition it was necessary that things should be produced at the lowest possible cost. The farmers in this State, in handling wheat, had a very cumbersome and expensive method compared with those adopted by some of their competitors. In America and Canada they had the elevator system, which appeared to be much cheaper than handling bags. Owing to the local way of harvesting, and other things, the elevator system did not appear to be suitable to conditions here, and until some better means was discovered the South Australian farmer had no choice, but had to stick to the bags. The 4bush. bag was expensive compared with the elevator, but the 3bush. bag, as adopted by the Federal Parliament, was still more expensive. It appeared to him to be a backward step. The official estimate of the South Australian wheat crop last year was 19,397,672bush. To bag this farmers had to buy 538,824doz. 3bush. bags at 4s. 6d. per doz., amounting to £121,235. To put the same amount of wheat in 4bush. bags would have taken 404,118doz. bags at 5s. 5d. per doz., amounting to £109,448—showing a loss, by using the small bags, of £11,787. There was also the sewing to consider. It had been his custom, and he believed it a general rule, to pay 1d. each for sewing 4bush. bags. He considered that the small bag could not be sewn for less than 10d. per doz. To sew 538,824doz. small bags @ 10d. = £22,451; to sew 404,118doz. big bags @ 1s. = £20,205; showing a loss on the sewing of £2,246. Most of the wheat was moved with sack trucks, and as it took no longer to move a 4bush. than a 3bush. bag with a truck, and took just as long to weigh a 3bush. bag as it did to weigh the heavier one, it would take just one-third longer to handle a given lot of wheat. He did not know what wages were paid by wheat merchants and the time allowed for handling a given quantity of wheat, and therefore could not reduce this loss to actual figures, but it would amount to a good round sum. The 4bush. bag, when second-hand, was useful for chaff, &c., but now, owing to the Chaff Act, the 3bush. bag was of little use for anything second-hand. A bag of flour weighing 200lbs. was a neat and easy thing to handle, also simple to calculate tons, &c. Now that it was 150lbs. it also took one-third longer to handle. He noticed that our South African customers were complaining of the unsatisfactory size of the flour bags. If we did not consider our customers they were not going to consider us. We could produce wheat as cheaply in South Australia as anywhere in the world, but we could not afford to throw away the odds. We had a long way to ship it before it reached the world's markets, and it was our business to see that there was no unnecessary taxation put on us. With the small bag it cost the farmers in the first place £11,787 more than the big bags; the sewing cost £2,246 more; and with the extra handling, the uselessness of the second-hand bags, &c., he considered the loss would amount to no less than £30,000 per annum. If this amount went into the Government coffers he would say nothing about it, but as it was, it was an unnecessary addition to the cost of production. Members were generally agreed that through the indiscriminate filling of bags they sometimes contained considerably over what was a fair weight for lumpers to handle, and legislation was quite justified in checking such an abuse. It was considered, however, that the maximum should be revised, and that bags should be enlarged in order to hold 200lbs. This size bag would be convenient to handle, and when used for exportation of flour would give better satisfaction to buyers. It was considered expedient that the complaints made in this direction by millers in South Africa and the eastern countries of Asia should be attended to. It was thought that if the Federal authorities were approached in the matter the necessary reform would be effected. A resolution was carried unanimously that it was desirous that the various Branches of the Bureau throughout the State should consider the losses involved in the use of the 3bush. bag, with a view to securing through the Federal authorities their rejection of the small bag in favor of one holding at least 200lbs.

Nantawarra, August 25.

(Average annual rainfall, 15in.)

PRESENT—Messrs. Smith (chair), Herbert, Sleep, Sutton, Nicholls, Greenshields, and Gosden (Hon. Sec.).

WORKING FALLOW.—Mr. Nicholls, in referring to this matter, thought it was not wise to run the cultivator over the fallow in summer and leave it in open ridges fully exposed to the sun. It did not tend to conserve the moisture in the soil. It was better to harrow the land and leave it finer and more even on the surface. He recognised that land liable to drift should be worked with discretion. If worked too fine drifting would considerably increase. Where the nature of the soil permitted, fallow should be worked down fine for summer. Mr. Sutton had a small harrow which could be attached and worked behind the cultivator. This had the effect of cultivating and harrowing in one operation. He was not sure that both should be done at the same time. It perhaps was better to harrow later on, and with this other members agreed. Other members supported Mr. Nicholl's remarks.

Northfield, August 31.

(Average annual rainfall, 19in.)

PRESENT—Messrs. Williams (chair), Dall, Goldney, Holbrook, Kelly, Kemp, Rowe, Reynolds, and Mitchell (Hon. Sec.).

FARMYARD MANURE.—Mr. Goldney read a paper on this subject. If properly applied, farmyard manure enriched the soil both for grazing and cultivation. It should be carted straight from the yard to the paddock, and spread as soon as possible. In this way labor was saved, and the grass or crop speedily got the benefit of the manure. It was an old practice to heap up the manure till the seeds of weeds contained in it were killed; but he thought that whenever or wherever stable manure was put on the land there would be weeds to a certain extent. Members indorsed Mr. Goldney's views, but considered that after spreading the fresh manure over the soil it should be ploughed in or otherwise turned under at once.

TREE-PLANTING.—The Hon. Secretary gave a short address on this subject, illustrated with sketches. Tree-planting provided shade and shelter for cattle and the homestead, fuel for the kitchen, and also enhanced the value of the property. Members agreed, and expressed the opinion that for all-round utility the Aleppo pine surpassed the sugargum.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Maitland, September 4.

(Average annual rainfall, 19½in.)

PRESENT—Messrs. Opie (chair), Bawden, Bentley, Hasting, Heileman, Hill, Jarrett, Kelly, Lutz, Tossell, Heinrich, and Pitcher (Hon. Sec.).

FOALS.—Mr. Jarrett asked how best to treat poor and unthrifty foals after weaning. Mr. Hill gave several instances of foals that were poor—they were found to be suffering from worms. Mr. Bentley thought plenty of oats would be a good thing to give. Mr. Tossell would feed plenty of corn to horses which he was breeding for sale to produce bone, but for use on the farm he would not feed much corn. Mr. Hill thought that feeding with corn would feed the worms. He also suggested that farmers should save some straw and winnowings to feed to young stock in cold weather. The general opinion of members was that plenty of green feed should be given and long hay and bran.

FOXES.—Mr. R. Passow's paper on the extermination of foxes (printed on page 59, August Journal) was discussed. Mr. Hasting had observed that foxes were poisoned wholesale in the district by laying poisoned sheep-plucks or carcasses of dead sheep and lambs. Poisoned fowl with the feathers singed to produce a strong odour had been very

effective. Mr. Heinrich thought a better way was to drag the entrails of a sheep over the ground as a scent to attract the fox. For bait, he recommended boiled liver cut in pieces, placed in the ground by digging a hole 6in. deep, placing some grass on the bottom, then the bait, then more grass on the bait, and earth on top of the lot. Poisoned apples were effective, as also was poisoned cream smeared on stones. The Branch was not in favor of compulsory payment for scalps of foxes through the district council, as suggested by Mr. Passow in his paper.

INSPECTION OF STALLIONS.—This Branch was not prepared to support any proposal to levy a tax on stallions travelling for hire.

Paskeville, September 25.

(Average annual rainfall, 15 $\frac{1}{2}$ in.)

PRESENT—Messrs. Price (chair), O'Loughlin, Curnow, Rundle, Goodall, Pontifex, Wehr, Forbes, and Palm (Hon. Sec.).

CUTTING AND TAILING.—Mr. Pontifex read a criticism of a paper on this subject (printed on page 58, August *Journal*). “Mr. Brook, of Johnsbury Branch, was reported to have stated that after a two years' trial in tailing lambs by means of fire-irons he was confident that it was far worse for the lambs, inasmuch as it caused the tail to swell; the wound took very much longer to heal, and it was more likely to be flyblown. His own experience of two years differed considerably from that of Mr. Brook. He admitted that there might be a little time lost in putting irons in and taking them out of the fire-basket or drum. With the knife, the lambs frequently would walk away a few yards and then lie down, the bleeding being so profuse as to invariably leave quite a pool of blood, and the lamb was rendered quite weak for the time being. This state was never brought about by searing or burning off. In no instance had he discovered a lamb flyblown after searing; in fact, he was rather inclined to the opinion that the risk was greater when the knife was used, because there was so much blood. On the other hand, the act of searing left no blood. Flies preferred a moist rather than a dry surface to blow upon. All lambs squirmed, more or less, under the operation of tailing, whether accomplished with knife or searing-irons. He would not at present discard the modern practice of tailing with hot irons. In reference to searing colts, his opinion was that bloodpoisoning was brought about, not so much from the effects of the searing-irons, as in allowing the colt to lie down where there was an accumulation of stable or other manure, and so allowing the disease germs to get into the newly-formed wound.

WESTERN DISTRICT.

Cummins, August 28.

PRESENT—Messrs. Cooper (chair), Brown, Hill, I. and J. Durdin, and Sivior (Hon. Sec.).

CATERPILLARS.—Mr. Durdin reported that he had 50 acres of wheat and 150 acres of feed eaten right off by grubs in the space of a fortnight. The ground seemed full of them. They were about 1in. or 2in. in length. It was resolved to send some of the caterpillars to the Department of Agriculture for identification. [These are the caterpillars of a moth. If they work underground and eat off the plants below the surface, rolling with a heavy roller in the early part of the season might do away with the pest, but if they do the damage by feeding off the plants above ground the best thing to do is to lay poisoned baits as described in page 633 of May, 1907, *Journal*, and page 613 of January, 1908.—ED.]

MILL FOR DISTRICT.—Mr. Hill considered a flourmill would be a distinct advantage to Cummins and the district generally, and a great convenience to all; but he very much doubted whether it would pay until there was another 100 miles of railway or more. Mr. Durdin thought a mill should be put up at once. The Hon. Secretary thought the time had not yet come for such a venture.

Koppio, August 26.

(Average annual rainfall, 17in.)

PRESENT—Messrs. Price (chair), G. G. and M. Gardiner, Newell, Brennand, Thompson, F. and R. Richardson (Hon. Sec.), and one visitor.

FALLOWING.—The following paper was read and discussed:—"If a farmer in this district were asked why he fallowed his land, he would at once say that he did so because it increased the yield of his crop. There were several reasons for fallowing, all of which helped towards a better crop. In the first place well-worked fallow considerably lessened the amount of work at seeding time, and also made the necessary work easier to do. If a man had well-worked fallow he could get on with seeding without any delay, and the crop would have a better seedbed. A cleaner crop was also a result, and a clean crop meant a better yield. By fallowing and keeping the land well worked the production of plant foods was greatly facilitated, and consequently the young plants were better able to grow. This was the most important aspect to consider, because even with a perfect seedbed and absolutely clean land, if there was not sufficient plant food available the plant could not grow. There were always organic changes going on in the soil, and when the land was loosened and kept stirred up the micro-organisms that brought about these changes had favorable conditions for working. When organic matter was ploughed in it decomposed and formed plant food, but time was necessary for this decomposition to be completed. If this organic matter had been lying in the soil for eight or 10 months, practically all the plant food in it should be ready for use. One large constituent of organic matter was carbon, from the oxidation of which carbon dioxide was formed. This gas became dissolved in the water contained in the soils and imparted to it a greater dissolving power on the mineral substances in the soil, and it was only in solution that plants could absorb the food they needed. By working the soil with cultivators, &c., a new distribution of the organisms which promoted nitrification was brought about. In liquid these organisms moved about freely, but in dry soil movement became more difficult, and they confined their actions to one place unless they were stirred up and carried to other parts. It would be seen, therefore, that fallow not only prepared a good seedbed and conserved moisture, but it helped the micro-organisms present in the soil to work with far greater results. He was a great believer in fallowing new land, and had always found it successful. There was bound to be a lot of humus and organic matter ploughed in, and also the land in many cases had become closely packed, and had remained so for a great many years, so that it had been very difficult for the air to circulate. If land was lying in a loose state for eight or 10 months there would be a tremendous lot of plant food made available in that time." A good discussion followed, members generally agreeing that fallowing was essential to good crops in this district.

STRANGLES.—The Chairman recommended as treatment for this complaint, eucalyptus and Stockholm tar. The Hon. Secretary preferred to let nature work its own cure, merely keeping the horse warm and giving a laxative diet. In reply to a question, members considered that horses were not likely to suffer from this complaint more than once.

Miltalie, August 28.

(Average annual rainfall, 14½in.)

PRESENT—Messrs. J. W. Atkinson (chair), F. and J. Jacobs, Wright, Scarle, F. L., M., and A. B. Grund, W. G. and E. P. Smith, Howell, Story, Laffin, Fairbank, C. E. and R. J. Scarle, W. H. Atkinson, J. H. and M. K. Frost, Topley, Hier (Hon. Sec.), and nine visitors.

FARMING.—A paper on farming under local conditions was read by the Hon. Secretary to the following effect:—"A small farm would generally pay better, proportionately, than a large one, because every acre was made to pay for itself. On a large farm frequently half the land had to pay the expenses of the whole farm, while the other half was lying idle and was a great harbor for vermin. In this district from 1,000 to 2,000 acres was enough land for one man to hold. That amount worked the right way would keep a man comfortably, and he would not have to employ much labor to work it. The first work was to clear all the scrub, so as to leave no harbor for vermin, then to divide the farm into small paddocks, as better feed was secured by so doing. Two hundred and fifty to 300 acres was enough to put under crop at a time. By the time 250 acres was in crop, and another 250 acres fallowed and worked well, it would be getting late in the season, and the horses should have a spell while the feed was good, to get them in good heart for the harvest. It was necessary to have a good stack of hay. He believed that the land was not worked as it should be in this district on account of the scarcity of horse feed. Wheat sown for hay should not, in his opinion,

be pickled, as it seemed to come up thicker and better without. It was not advisable to put too much manure on the ground being sown for hay, as the hay was not so sweet. Horses required a good deal of long hay as well as chaff to keep them in good health, and the majority of them should have more attention than they usually received. A cold, wet yard was bad for horses. It caused their legs to become stiff and numbed, and also injured their general health. A small farmer had more time to improve his farm than the man with a large holding. Good fences often prevented ill-feeling between neighbors, and if fences were good and land was fairly clear of scrub it would not take long to destroy the rabbits. Trapping was the best and cheapest way to dispose of this pest. Fumigating he considered too expensive for the number of rabbits killed. Every farm should have a good shed for implements, and these should be put away in the shed as soon as they were finished with for the season. Any leather belts connected with implements should be taken off and well oiled with neat'sfoot oil during the winter months. When the farm was divided into small paddocks, a few sheep should be kept for the meat supply. They would also help to keep the weeds down on the fallow." Members generally complimented the writer on the paper. They considered many points raised were well worthy of attention.

Penong, August 14.

(Average annual rainfall, 12½ in.)

PRESENT—Messrs. Shipard (chair), Kreig, Olsen, Edwards, Brook, Farrelly, and Oats (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that nine meetings had been held during the year, with an average attendance of over seven members. Seven visitors had attended. The subjects discussed were "Fallowing," "Pickling," "Care of Shoulders," "Horse-breeding," "Pruning," and "Farm Management."

TAKEALL.—Mr. Farrelly contributed a paper on the subject of takeall. He did not consider there was sufficient evidence to suppose this trouble to be due to either poorness of land or the work of insects, but he thought deep ploughing might have something to do with it. Last year he sowed a paddock of fallow when it was dry, with the exception of a small strip. This strip was ploughed and sown after rain, using the same quantity of seed and manure as for the rest of the paddock. The part put in dry was free from takeall, while that which was sown when wet was badly affected. The trouble was present both with Carmichael's Eclipse and Comeback. The same patch was slightly affected this year. In the discussion which followed evidence was quoted to show that the trouble was due to the work of insects, while other evidence was to the contrary. It was agreed that crops seemed more liable to it if put in when the ground was wet, and that burning the stubble had a good effect. More than one member had seen it on land that had been fallowed dry and deep.

CATERPILLARS.—It was reported that caterpillars were very numerous in grass paddocks, and in some places had taken a good deal of wheat. Various methods were adopted to destroy this pest, such as dragging chains and bushes, and trenching where they were travelling in considerable numbers. This prevented them from destroying much wheat.

Penong, September 11.

(Average annual rainfall, 12½ in.)

PRESENT—Messrs. Shipard (chair), Kalmar, Brook, Bennier, Farrelly, Edwards, Olsen, Saunders, Lovell, Oats (Hon. Sec.), and one visitor.

HARVESTING.—The Hon. Secretary read a paper on the question of harvesting with the stripper, this being the machine principally used in the district. He considered that stripping should be started as soon as the wheat was ripe, and often he commenced before it was all quite ripe, using any soft grains for horse feed. As a large quantity of wheat was fed to the working stock during harvesting operations, the first reaped could with advantage be used in that way. A farmer with not more than 300 acres of crop to reap could manage with one stripper, but if he kept an extra hand and used two machines it would be better. It would pay to keep an extra man even with one stripper, as he could assist in changing the team and so keep the stripper going all the day. He would also be available on dull days to work the winnower. To reap, say, 600 acres with two strippers and three teams, each of three horses, he would proceed as follows:—Start two machines working, and after an hour take out one team, feed them, and put in the team that had

been waiting. In another hour take out the other team and put in those that had been feeding, and so on all through the day, each team working two hours and feeding one hour. They would keep up a fair pace all day, and would do about as much as would three machines. If working three machines, all would need to stop in the middle of the day for the purpose of feeding, and often that was the best part of the day for stripping, especially near the coast. A sheet to empty the stripper on he made of bags ripped down and sewn together. The winnower was placed on a small sheet alongside, and the wheat was cleaned as it was brought in by the strippers. It was necessary for two of the men at the winnower to drive the strippers while the others had their mid-day meal, and although a little time would be lost with the winnower it need not be great. An extra sheet or two would be found useful if the crop were very heavy and to save waste of time when moving the stripper to another paddock. Sometimes the wind would be unfavorable for making a good sample once through the winnower. In such case the bags could be left open, and on damp days, when the strippers could not work, it could be put through again. If possible to cart the wheat into a shed at night it would be found that the bags would be kept in better condition and the weight would probably be greater than if left out in the paddock. Members generally agreed with the methods outlined in the paper. Some, however, did not consider it wise to reap the wheat before it was quite ripe. While it was thought that the method of changing the team to keep the stripper and winnower going all the time was a good one, some were of opinion that it would be a difficult matter to keep sufficient men to do it, especially to keep them working in the middle of the day.

LETTUCE.—Mr. Bennier tabled a fine lettuce, which showed what the local soil was capable of producing.

TURNIPS AND WHEAT.—Having inspected Mr. Edwards's wheat crop, which appeared to promise a good yield, members left the field with as many turnips as they could conveniently carry. The seed was sown with the wheat through the drill, and a remarkable crop was the result.

Shannon, August 28.

PRESENT—Messrs. Neate (chair), Habner, Williams, Carey, Irons, W. and H. Glover, L. B., E. B., and W. Smith (sen. and jun.), J. Cronin, B. and C. Havelberg, and J. J. Cronin (Hon. Sec.).

CONFERENCE OF WEST COAST BRANCHES.—This Branch decided to support the proposal to arrange a Conference for the West Coast.

SHEEP ON THE FARM.—Mr. Cronin read a paper on this subject, which he considered was a most important matter in connection with mixed farming. Although this was a new district, a farmer who had been settled three years should have at least 50 sheep. Weeds would come in time, by means of chaff, &c., but sheep would keep them down. For three months of the year almost any farm in the district would carry about 50 sheep, allowing them to run on the wheat crop. This would benefit the crop rather than otherwise, provided the sheep were not turned on to it before it took root firmly. A small paddock of about 20 or 30 acres should be sown with a mixture of rape and rye, and be ready to put the sheep on when they came off the wheat. This would keep them going up till January, by which time supplying the farm with mutton would have thinned out the number considerably. The best sheep for the district would be a Shropshire-Merino cross. These would be large framed sheep, and should do well. The general opinion of members was that crops in this district benefited by judicious feeding off, and sheep paid to keep. Mr. Cronin preferred the pure Merino, but the Chairman considered the crossbred better, as it was harder and better able to stand the cold climatic conditions of the district.

Shannon, September 25.

PRESENT—Messrs. Neate (chair), S. and J. Carey, H. and W. Glover, J. and M. Cronin, Kain, W. M., L. B., and E. B. Smith, Whetstone, and J. J. Cronin (Hon. Sec.).

HOMESTEAD MEETING.—Members inspected the plots with which experiments are being carried out with manures on the property of Messrs. Cronin & Sons. They considered that the plot which was treated with 56lbs. mineral super. per acre would be the best paying crop of all. After tea the usual business meeting was held.

DEEP v. SHALLOW PLOUGHING.—Mr. Fleming introduced the subject of deep *v.* shallow ploughing. He advocated shallow ploughing in new land of this district, especially if

of a sandy nature. Mr. Cronin preferred deep ploughing—from 4in. to 6in. If the land was not ploughed fairly deeply it could not retain sufficient moisture, and could not form a good seedbed. The Chairman also advocated deep ploughing for the same reason, and the majority of those present were in favor of giving the ground a good ploughing.

Utera Plains, August 28.

(Average annual rainfall, 14in.)

PRESENT—Messrs. Holmes (chair), Venning, Chase, Gale, R., T., and H. Hornhardt, Stephens, West, Deer, Pulford, Lee, Hill, J. and M. Abrook, Ramsey (Hon. Sec.), and three visitors.

FIELD TRIAL OF IMPLEMENTS.—A field trial was held on August 25th under the auspices of the Miltalie and Utera Plains Branches, in a paddock belonging to Mr. W. Jacobs. About 400 people were present. Twelve implements were entered for the heavy plough competition. Messrs. J. and D. Shearer being placed first, with 70 points, and Mr. J. Edwards, 65 points, out of a possible 75. In the skim ploughs Messrs. J. and D. Shearer were again first and Mr. J. H. Rosewarne second. In harrows Messrs. J. and D. Shearer were first and Messrs. Rohn and Turner second. The first prizes for the best six-horse team and the best four-horse team at work were both carried off by Mr. S. Aunger, while Mr. J. Story secured the second place in either case. The prize draught stallion was exhibited by Mr. S. Aunger, Mr. A. Whitbread's animal taking second place.

HOMESTEAD CONVENiences.—Mr. Abrook read a paper on this subject. He considered that gates should be constructed to open both ways. They should be fitted with a sill and of course be vermin-proof. A great deal of loss was caused by the depredations of mice, consequently he intended to build a mouse-proof garner of corrugated iron, with the corners turned and all joints of sheets riveted. The iron would be let into the ground about 6in., and there would be a concrete floor. The door would be raised to the level of a wagon bed. If mice or weevil were carried into such a place as this they could be destroyed by fumigation with bi-sulphide of carbon. To facilitate slaughtering, every farm should have an endless chain pulley. With it a lad could pull up a ton weight. It was useful for raising horses or cattle if they got down through illness. For pickling seed wheat a tank made of reinforced cement was by far the best. Tubs and similar vessels became rusty and warped and were never so satisfactory. A blacksmith's outfit, including a good grindstone about 3ft. in diameter, were all of great advantage on a farm. Members agreed that much more could be done on most farms to provide homestead conveniences, particularly in regard to good gates which could be opened and closed without delay. Improvements of this kind increased the value of the farm to no small extent.

FLAG SMUT (BLACK Rust).—Members wished to know the cause of (so-called) black rust. In this district Gluyas seemed to be affected more than other varieties. [This flag smut, miscalled black rust, is a fungus disease which chiefly attacks the flag, but it may also occur on the sheath and stem, and even on the chaff, destroying the grain. Plants affected rarely come to ear, and if they do, and grain is formed, it is extremely small and shrivelled. Professor McAlpine recommends pickling seed with formalin at the rate of 1lb. to 40galls. of water, steeping the seed in it for 10 minutes, and then allowing it to dry before sowing. He points out that as formalin has proved to be effective for the prevention of stinking smut or bunt of wheat the fact of it also acting as a preventive of flag smut is an additional reason for using it in preference to the bluestone pickle wherever flag smut is to be feared. The objection to formalin is that unless the wheat germinates fairly soon after pickling and sowing it injures the grain.—ED.]

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Bowhill, August 28.

(Average annual rainfall, 10in.)

PRESENT—Messrs. Weyland (chair), Drogemuller, Cockshell, Thomas (Hon. Sec.), and one visitor.

UNSOULD STALLIONS.—Members considered that some steps should be taken to prevent the importation of stallions into South Australia from those States in which they had failed to pass examination,

WHEAT CROP.—Mr. Drogemuller reported that he had 75 acres of fallow drilled with Gluyas Early wheat and 40lbs. of super. The crop now looked very promising. He also had 60 acres of Red Straw wheat, the second year's crop on new land. This plot, some Marshall's No. 3, and Yandilla King, all looked healthy and promising.

Coonalpyn, September 24.

(Average annual rainfall, 17½in.)

PRESENT—Messrs. Hill (chair), Venning, Liersch, Fidge, Bone, Allengame, and Cavenagh (Hon. Sec.).

POULTRY-BREEDING.—Mr. Allengame read a paper on the question of poultry-breeding. He thought many people over-estimated the profit to be derived from this source. After 22 years dealings with both pure and crossbred fowls he considered that he had lost money in the business. He admitted, however, that he had not kept records of the cost of feed consumed, nor of the revenue derived. He thought that most people in the district who had gone in for fowls had given it up and gone in for something that was more profitable and less trouble. Prices of eggs, cost of rearing, &c., were given, and the many risks enumerated to show that, in the opinion of the writer, poultry-keeping was not worth the trouble involved. With one exception, all the other members considered that with proper care and attention keeping fowls could be made to pay. Some of these gentlemen had derived handsome profits from the industry, and considered it paid better to keep wheat to feed fowls than to sell it.

Forster, July 31.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. Johns (chair), J. and W. Searle, Towill, Copp, Helbig, Sears (Hon. Sec.), and one visitor.

BEAUTIFYING THE FARM.—Mr. James Searle read a paper on farm improvement, in which he claimed that most farmers could very well afford to spend more time in improving the appearance of the homestead. Two or three days every year could be devoted to planting trees, such as sugar gums—trees which after the first two years required little or no attention. He also advocated a few boxthorns, as they provided shelter for poultry and made a good fence for keeping in the stock. Fruit trees should also be grown on every farm, and ornamental trees of any kind that would thrive. Time occupied in so improving the appearance of a farm was well spent. There was no reason why all the beautiful homes should be in the cities and towns. Growing trees as described, putting fences in evenly and straight, and generally touching up and improving the appearance of a farm greatly enhanced its monetary value, as well as breaking the monotony of ordinary farm work.

Forster, August 28.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. F. Johns (chair), Payne, W. and E. Towill, J. and W. Johns, J. and W. Searle, Whitfield, Helbig, Sears (Hon. Sec.), and three visitors.

STABLING HORSES.—Mr. W. Searle read a short paper on the care of horses, particularly in regard to stables, which he thought should be one of the first considerations on the farm. It was cruel to put horses in a place where the rain could drip on to them and the cold wind blow in from any quarter. Unless provided with a good stable, many horses would be inclined to jib and play up in the morning after a cold night, and all knew that the long-lived horse was the one that had been well stabled and cared for. In this district a suitable stable could be made of pines. He would have a straw roof in preference to an iron one, as it was so much cooler in summer. The pines should be all barked, so that there might be as little harbor for vermin as possible. The appearance was also improved by "barking" and the wood lasted longer. The stable should be closed in all round, and be provided with sufficient doors. It should be of a good height, and, if possible, built on sloping land, with the entrance at the lower end, so that the water would run past and not lodge in the stable yards. Stalls should be kept clean and dry and be provided with beds of dry straw every night.

Lameroo, August 28.

(Average annual rainfall, 16in.)

PRESENT—Messrs. F. W. Eime (chair), Edwards, C. R. Eime, Leekie, Wittwer, White, Walsh, W. and F. Thyer, Skinner, Shannon, Ross, Needs, Wray, Trowbridge, Dodds, R. B. and A. J. A. Koch (Hon. Sec.), and five visitors.

FENCING.—Mr. Wray read a paper on fencing, as follows:—Owing to the scarcity of fencing material in this district it was somewhat difficult to know what kind of fence to put up. The pine posts did not last long, but for those who had plenty they were the best. He put in some native posts two years ago, and they could be snapped off by giving them a pull, while others, sent from Tailem Bend, the white ants had half eaten in two years. Unless posts were procurable on the farm it did not pay to go to the trouble of getting them, as they cost at least 6d., and there was a lot of labor attached to the sinking of holes and boring. To use all pine posts, putting them 12ft. apart, including two barb wires, a mile would cost, say, £20, and then there was always a danger of fire. The best fence, in his opinion, was one that was coming into use in most parts of the State, it was everlasting and fireproof, and was made of angle-iron. Such a fence gave more satisfaction than either T or flat posts. Some people made a great mistake in not putting posts or irons far enough into the ground. It was evident that a post could not stand firm unless it was well let into the ground. He would recommend the following:—Good gum strainers, which could be delivered here for about 7s. 6d. each, and angle-iron, 1in. x 1in. x $\frac{1}{4}$ in., 4ft. 6in. long. That would allow for 14in. in the ground, and it would be wise to have a few a little longer for the sand. There should be two barbs attached at first, but the holes should be ready for making it sheep-proof when necessary. The spaces between the six wires would be 10in., 7in., $5\frac{1}{2}$ in., $5\frac{1}{2}$ in., and the bottom one $6\frac{1}{2}$ in. from the ground. For a five-wire fence, 12in., 8in., 6in., 6in., but he thought it paid to put in the extra wire. He would use barb wire 14 x 3—it went further, and if stock ran into it it would break. It was better to have a broken fence than a broken horse. For the plain wire, Johnson's galvanized resistee was as strong as the ordinary No. 8, and 1ewt. measured nearly as far again. It did not stretch and become loose. This kind of fence would not cost so much as one with pine posts, and being fireproof would last a lifetime, while, in erecting it there was not half the labor involved. Angle-iron posts could be delivered at Lameroo at £11 10s. per ton, and there were 580 to the ton. Mr. Shannon fenced 3ft. 9in. high. Barbed wire on the top and four plain wires below. T iron posts were driven into the ground about 10in. He put a pine post every 11yds. and two iron posts in between. This would keep the bottom wire near enough to the ground. Mr. Trowbridge preferred pine posts 1 chain apart. He used angle-iron posts between and would fence 3ft. 2in. high. He said that resistee would break on the frosty morning if too tightly strained. Some of the members preferred gum to pine posts.

FIELD TRIAL.—On August 24th, the Field Trial Committee, which has been working for about three months, brought their trial to a successful issue. The entries were exceptionally good, and about 20 implements, besides harrows, scoops, petrol engines, wind-mills, &c., were working. This being the first venture of its kind in the district, no prizes or certificates were awarded. There were about 400 people present, chiefly members of the farming community.

Mannum, August 28.(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT—Messrs. Walker (chair), Faehrmann, Arnold, Pfeiffer, Heidrich, Lenger, and Schuetze (Hon. Sec.).

NOXIOUS WEEDS.—Members were of opinion that all noxious plants should be illustrated in the *Journal* on colored plates (in natural colors, if possible), and description, size, &c., given, so that producers would have a better chance of identifying them and checking them before they obtained too great a hold.

TAKEALL.—Mr. Lenger reported that a good deal of takeall was showing up in his crops and those of his neighbor.

Parrakie, August 30.

PRESENT—Messrs. McGuire (chair), Dayman, Willis, Ferme, Wittwer, Beelitz, Diener, C. Burton, Gravestocks, Morrison, J. Burton (Hon. Sec.), and nine visitors.

WHEAT-GROWING.—The Hon. Secretary read a short paper in which he claimed that it was a mistake to attempt to put a very large area under crop. The land became overrun with shoots if this were done, while a smaller area cultivated so as to get as good a

crop as possible would pay better. To have the land one year in fallow and one under wheat was not the best practice. It should be at least one year in grass after wheat. He would put in 80lbs. to 120lbs. super. with 1bush. of late wheat per acre. For an early variety he would sow 1½bush. of seed to the acre. The superphosphate appeared to enable the wheat to withstand the cold of winter and the dry spells also. The grain filled out better, and the crop matured with less rain. The methods of preparing the land, manuring, etc., which gave the best results with wheat as a general rule also gave the greatest quantity of feed. Mr. Beelitz considered that ¼bush. of seed wheat was sufficient in this district. Mr. Dayman agreed, so far as the late varieties were concerned, but for early wheat he would sow a bushel per acre. He also advocated the heavier applications of super., up to 120lbs. per acre.

Cows.—Mr. Dayman wished to know which was the best class of cow for a farmer to keep in this district. Mr. Diener considered the Jersey best, while Mr. Burton favored the Durham breed as the best all-round cow to keep. They were best for the butcher when finished with for breeding purposes, and some were good milkers. Mr. Short considered the last named as best for the farm, but preferred the Jersey as a dairy cow.

Rhine Villa, August 27.

(Average annual rainfall, 10½in.)

PRESENT—Messrs. Payne (chair), Mickam, Hecker, Hayden, and Vigar (Hon. Sec.).

WATER SUPPLY.—A paper on this subject was read by Mr. Hayden. He would give his experiences of over 20 years' observations of the local water supply. When he first came to this district in most cases the water supply was very scanty. People had dams scooped out; some had to cart for miles. A few sunk wells and had the old fashioned windlass, others had a whip and horse. Afterwards pumps and windmills were installed, and there was now scarcely a farm in the district without a splendid water supply, unsurpassed in any part of Australia. There were some districts where there was a very heavy rainfall, and every few years people had a water famine at the end of a dry summer. Most farmers were able to grow a nice supply of vegetables for their own use; some had some to sell. This was a great benefit, as in times gone by, people here were in summer quite dependent on an outside supply of vegetables. Most of the underground water got by boring appeared to grow vegetables to perfection. Another point to be considered was the carting of water over the district roads, the loss of time to the farmer, wear and tear of wagon or dray, and tanks, where it became necessary to get water in this way. There appeared to be an unlimited supply underground. Of course what one windmill and pump could bring up after watering stock was not sufficient for irrigating on a large scale.

Sherlock, August 28.

(Average annual rainfall, 15in.)

PRESENT—Messrs. Wood (chair), C. J. and A. Osborn, S., R. H., and F. C. Stringer, Nock, Nicksch, Coombe (Hon. Sec.), and five visitors.

WHEAT COMMISSION.—Mr. C. J. Osborn read a paper on this subject to the following effect:—"Since the appointment of the Wheat Commission we have heard a great deal relative to the methods adopted by merchants and millers in the purchasing and exporting of wheat. Many farmers are divided in their opinion as to the relative merits and demerits of the work so far accomplished by this Commission, whilst others seem quite indifferent as to whether the Commission's work will ultimately benefit them or otherwise. The dull apathy exhibited by some farmers in this respect is truly surprising, when one considers that the ultimate result of this inquiry is of such vital importance to them. One Branch of the Bureau transgressed so far as to intimate that their members were not sufficiently interested in the work of the Commission to appoint delegates to impart any information in their power. At present South Australian farmers are recognised as being the most efficient of any in the Commonwealth. Having progressed so far, can we not still further improve our methods of cultivation, and by a systematic course of cross-fertilisation and selection with the object of increasing our flour and gluten strength, rank first in the world's markets. Individually we may not at present benefit to any appreciable extent by the Commission's work, but collectively we should eventually benefit to a great extent. A Commission involving every conceivable branch of our business cannot fail to eventually improve the position of the South Australian farmer, and bring him more into line with his fellow husbandmen of the Commonwealth and

the world. As instanceing this, allow me to direct your attention to a few of the Commission's recommendations. '(1) That the Government open up communication with the Chamber of Commerce with the view (*a*) of arranging for the inclusion in the Corn Trade Sectional Committee of the Principal of the Roseworthy Agricultural College, and a representative farmer (to be nominated by the Advisory Board of Agriculture); and (*b*) of securing the fixing of the standard at an earlier date in the season than at present.' '(2) That an experiment in the bulk shipment of grain be conducted during the ensuing year.' '(3) That the Government, for experimental purposes, undertake the shipment of grain for farmers through the Produce Depot, in the same way as lambs and other produce are dealt with.' '(4) That parcels of wheat above the f.a.q. standard be forwarded to Europe for experimental market purposes.' '(5) That the Commercial Agent in London be requested to do all in his power to increase the popularity and use of South Australian flour as a complete bread substance.' '(6) That the railway freights be reduced so as to approximate more closely to the rates in force in New South Wales and Victoria.' '(7) That farmers unable during the coming season to secure a higher price for wheat above the standard be invited to communicate particulars of their experience to the Commission.' '(8) That the various Agricultural Bureaus be specially requested to forward average samples of the new season's wheat of their respective districts to the Corn Trade Sectional Committee of the Chamber of Commerce with the view of securing a thoroughly reliable determination of the average quality of the wheat of the State.' I have quoted only a few of the recommendations made by the Commission, but sufficient, I hope, to emphasize the importance of its work. Some people demur at the appointing of Royal Commissions, believing that the expense incurred greatly outweighs the amount of good effected by them, but to my mind money expended in this direction is money exceedingly well spent, as much available information is derivable in a very short period of time which, without their aid, we should not receive." The paper led to considerable discussion. Members were not satisfied with the present system of marketing wheat. Grading of wheat was favored, as farmers would be encouraged to clean their wheat thoroughly, and also to grow a higher class grain.

VEGETABLE-GROWING.—Some discussion took place on the growing of vegetables in this district. Members thought that a considerable variety of vegetables could be grown successfully during the winter and spring, and advised trying experiments in this direction.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, August 31.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. A. Jacobs (chair), T. Jacobs, J. and C. Lewis, J., T., and G. Brumby, Hicks, Chapman, Kayser, Isaac, Ricks, Curmow (Hon. Sec.), and four visitors.

ORCHARD CULTIVATION AND MULCHING.—A paper was read on this subject by Mr. Kayser, to the following effect:—"The importance of cultivation in an orchard could not be overestimated, but there were in this State a great number of orchardists who did not understand in theory nor in practice the value of it. A clean orchard was essential to the successful production of good fruit. Cultivation at the wrong time of the year might be detrimental and injurious to an orchard. From observation, he was fully convinced that early ploughing, after the first rains, was not the best practice. At a time when the ground would shortly become saturated with moisture, it was better that the roots should be left entirely dormant and at rest. Early cultivation of land gave the superfluous water easy access to the roots, and rendered the ground more or less a quagmire. The roots were subjected to unnecessary cold at a period when they needed all the warmth they could get, and the ground became soured. Although weeds would grow in the absence of early cultivation, the orchardist would be repaid by ploughing in all weeds, &c., in the spring, and this would add to the ground some of its natural manure and mulch. It would pay well to mulch even a percentage of the trees in an orchard, but, of course, the more trees treated the better. Old straw, grass skimmings from the nursery, &c., should all be heaped up and saved, and after digging round the trees, judiciously applied to the surface. He had experimented in this direction with trees on the Adelaide plains, and had always found that cultivation in the spring, just before the last

rains, followed up with mulching, had given wonderful results in the conservation of surface moisture at a time when it was most needed." Mr. Jacobs agreed with the paper in general, where cultivation was necessary, but he thought that where orchards were situated in the gullies so much cultivation was unnecessary. He considered the main factor in successful fruit-growing was to thoroughly break the ground to, say, 18in. in depth before planting the trees. After the trees had become established he would lay the ground down to lucerne, thus adding nitrogen to the soil, and at the same time giving abundance of feed to his cows. Mr. Curnow thought the best mulch was thorough cultivation. He did not care for grass mulching, as it was a nuisance when scarifying, and it also harbored pests—such as the codlin moth and cuelio beetle, &c. Messrs. Jos. and C. Lewis thought mulching was an advantage; the greatest difficulty was in procuring the grass. Mr. Jacobs agreed with this. Mr. G. Hicks said that until he commenced growing potatoes beneath a few old Cleopatra trees he could not grow 10 cases of saleable fruit; but now, with good cultivation, he could grow 50 or 60 cases each year. He believed in intense culture.

Golden Grove, August 26.

PRESENT—Messrs. Robertson (chair), Milne, Maxwell, Angove, Tilley, Ross, and Harper (Hon. Sec.).

FERTILISERS.—Mr. Milne read a paper on this subject to the following effect:—The necessity for manuring will be made apparent by a consideration of the fact that everything which is sold off the farm, whether stock or crops, removes a number of substances from the soil, and that in order to keep the land from deteriorating part at least of what has been taken out must be returned. Of the ingredients removed by crops, most of them are present in sufficient quantities in all soils, though nitrogen, phosphoric acid, lime, and potash are sometimes deficient. There may be an abundant supply within the soil of all the elements of plant food with the exception of, say, phosphoric acid: but until that substance is added to the land a full crop cannot be grown. Hence the necessity for ascertaining in which food substance any particular soil is deficient. To add nitrogen or potash when the land is really in need of phosphates would simply be a waste, as no beneficial result would accrue. The special requirements of each particular crop must be considered, and the kind of soil on which the kind of crop is to be grown. Some manures are complete in themselves, and contain all the ingredients required by growing plants, while others supply only one or more of these substances. Of the complete manures, farmyard dung is the best. Its value and composition varies according to the kind and age of the animals contributing and on the quality and description of their food, and its value very much depends upon the care which has been taken to insure it against loss from the washing effects of rain. Not only does it contain all the elements of plant food, but it also contains a large quantity of vegetable matter, which improves the physical condition of the soil, keeps it warm, and renders it more friable. Vegetable matter is capable of holding large quantities of water, and by so doing it indirectly retains the soluble mineral plant foods forming the constituents of water in the soil. Farmyard manure yields up its fertilising ingredients during the process of decomposition, and this is most rapid when the soil is warm and moist, and is also the time when vegetation is most active and best able to make good use of them. There is a marked superiority in the manure made in covered yards over that made in open yards, the reason being that in the open yards it is washed by rain, and the washings are allowed to drain away, with the result that serious loss of nitrogen and potash occurs. To prevent the loss of ammonia, farmyard manure should be ploughed in as soon as possible after it is spread on the land, and the best results are obtained from moderate dressings supplemented by the application of the chemical ingredients, in the form of artificial fertilisers, most needed by the particular soil or crop. Gypsum may be used with it to prevent waste of nitrogen, but lime must never be mixed with the manure. Of commercial fertilisers nitrate of soda is an active and soluble manure, which contains 15 per cent. to 16 per cent. of nitrogen in a form which can be immediately taken up by the plant, and should therefore only be applied as a top dressing to the growing crop, and not sown with the seed, as if applied when the land is bare it may be washed out of the soil before the crop is able to make use of it. For cereal crops it is best employed when superphosphate has been sown with the seed. Sulphate of ammonia contains 20 per cent. of nitrogen, equivalent to 24 per cent. of ammonia, and it is valuable solely for its nitrogen. It is more readily fixed in most soils than nitrate of soda, and is more suitable for autumn use, especially in wet seasons or in wet districts. Superphosphate of lime is chiefly derived from mineral phosphates, and its value depends on the percentage of soluble phosphate present. Basic

slag, or Thomas' phosphate, owes its value to the presence of about 16 per cent. to 18 per cent. of phosphoric acid combined with lime. It is important that the slag be very finely ground. Its effects have been found to vary greatly, and not only in different localities, but on different fields of the same farm, and even on parts of the same field. The sources of supply and uses of bones, potash, lime, &c., were also dealt with. In treating of the purchase of manures he advised, where complete manures were required, to buy the ingredients separately and mix on the farm, as, in his opinion, it was more satisfactory and economical. As previously pointed out, the deficiency in any one necessary constituent will prevent a good crop being obtained, and it was therefore necessary for them to find out just what their soils needed. Every farmer should therefore conduct experiments on a small scale in order to obtain this information. In carrying out such experiments the plots require to be carefully measured, also the manures and the crop on each plot harvested and weighed separately. The paper led to some discussion. Mr. Maxwell did not think it advisable to apply stable manure for cereal crops, except in very moist conditions. In reply to inquiry as to probable loss of manurial constituents by leaching, Mr. Milne thought where the rainfall was heavy the loss might be considerable. The Hon. Secretary thought the value of manure was often greatly discounted by the shallow system of cultivation usually practised.

Gumeracha, August 30.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Randell (chair), Kitto, Porter, Monfries, Moore, Sandcock, Jamieson, Woolard, B. and A. E. Cornish, Lee (Hon. Sec.), and one visitor.

FATTENING PIGS FOR MARKET.—Mr. A. E. Cornish read a paper on this subject as follows:—"In the mixed farming of the hills districts I take this to be one of the most important factors. Where dairying is carried on to any extent pig-raising and fattening must of necessity be dealt in. I do not intend to deal with breeding and raising young pigs. I go to the market to buy what we term 'store pigs,' and look over the pens carefully, noting healthiness, breed, condition, and size. Healthiness first; because it does not matter how well-bred or how big they are, or how cheap they appear to be, there will be no profit in them if they are not healthy. The breed that I find best for fattening is a cross between the Essex boar and the Berkshire sow. If they are big stores they must have fair condition or they will get too big and heavy to be profitable before they are prime. I would suggest buying them fairly small, say something between 40lbs. and 60lbs., so that you can get them prime by the time they weigh, say, from 100lbs. to 125lbs. This is the most profitable time to sell, as anything over 130lbs. rarely brings so much per pound as the lighter weights. For food no improvement can be made on skim milk, peas, and pollard. If you have the means of scalding the pollard so much the better, as it goes so much further. In summer time feed the pigs at least four times a day, as they require a lot of drink—at 6 and 10 in the morning and at 1 and 6 in the afternoon. If given sufficient at one time to last several hours much will be wasted. To prevent the pigs from getting into the trough fasten bars across at about every 2ft. For the pigs to thrive the sties should be kept clean and dry and scraped out frequently. The pigs should have some freedom, but not too much. If possible they should be able to lie in the sun when they desire to do so. There should be a good stack of pea straw close at hand for bedding during winter, as pigs require much more food during the cold weather to put on condition, and every means should be employed to produce warmth and comfort. As warmth saves food it will pay to keep them warm. People often make the mistake of keeping too many pigs at one time. As soon as the young pigs are weaned we should begin to fatten them for the market—the younger the better. Some folk think that when they have weaned the pigs they must turn them out and let them grow; but if turned out the growth is very poor compared with what could be brought about, and there is a lot of time wasted in getting them started again. Where it is at all possible a supply of fresh water should be kept at or near the yard in a shallow cemented tank, built upon the principle of the bowl of a spoon, so that the pigs could walk into it and lie down in the water when the weather is hot. None of the farmyard animals are so easily affected by heat as a fat pig. Sometimes we are apt to be a little mean in feeding; this is a mistake, and the quicker a pig is fattened the more profitable it will be. If I can force into my pigs the same weight of food in four weeks that my neighbor does in six my profit will be greater than his, and by the time he has his in the market I shall have another pen half ready. If we go thoroughly into the business and give it our best attention, when we make up our returns at the end of the year we shall find that the time and money

spent on fattening pigs has been very profitable." In the discussion which followed Mr. Porter said that in dealing in pigs he had usually lost money. He thought the bath of water a good idea. Mr. Monfries considered that farmers should keep three sows and breed their own pigs. Hay tea, made from meadow or lucerne hay, was worth a trial. A supply of charcoal should be kept in the sty. Mr. Moore recommended copra cake as a good addition to the food list, and also steamed chaff. He did not approve of feeding more than three times a day, but believed in stacking unthreshed peas in the yard; this saved work and benefited the pigs. The majority of members considered that the pigs should have a roomy yard, so that they would get exercise. Mr. Randell preferred to keep them in a small sty for fattening. Opinions differed as to whether it was advisable to feed peas unthreshed, and as to whether it paid best to breed or purchase young pigs. It was stated that to make a profit it was necessary to grow all the feed on the farm. Mr. Cornish had kept careful records of all he spent, and was sure that if properly managed good profit would be made.

Hartley, September 2.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Tydeman (chair), Brook, Hudd, Paech, Pratt, Clark, Symonds, Wundersitz, Phillips, Bermingham (Hon. Sec.), and four visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. Hudd, but on account of it being a wet afternoon and the ground being so sodden with the heavy rains, members were unable to make a thorough inspection of the crops as arranged. The fruit trees, of which there were a large number planted near the homestead, were much admired. The almond trees had done remarkably well, having only been planted a short time; some of them were already bearing fruit. The shrubs planted around the house were considered a great improvement to the appearance of the property. The wheat crop appeared only to require a little fine weather to bring it on well. Mr. Brook had for members' inspection two of the feet of a foal which was foaled alive but only lived a few hours. It had a claw instead of each foot, with a bone attached to each claw running right up the leg. None of the members had ever seen anything like it before.

Kingscote, September 6.

(Average annual rainfall, 18½in.)

PRESENT.—Messrs. Turner (chair), Campbell, Castine, Yateman, Fitzlaff, Nash, Jacka, Mitchell, Wright, Neave, and Cook (Hon. Sec.).

EXPERIMENTAL WORK.—Considerable discussion took place on the question of the utilisation of land on Kangaroo Island. It was stated the cocksfoot grass was doing well on the ironstone soil near Harriet River, while rape and turnips were making splendid growth on the white sandy yacca country. It was resolved that the Government be asked to establish an experimental farm, members being of opinion that the fact of possessing over half a million acres of land free from vermin, with an assured rainfall, justified the Government in establishing a proper experimental farm.

PRODUCTS.—Messrs. Turner and Neave tabled good samples of potatoes. The former stated that he had grown some splendid crops of potatoes on the Island. Mr. Turner reported having killed a lamb which weighed 80lbs., and a number of four-tooths which scaled over 110lbs. dead weight.

SEARING LAMBS' TAILS.—Messrs. Jacka and Neave stated that they had used searing irons this year, and were satisfied that searing was much preferable to cutting with the knife. Mr. Turner, however, had tried searing, but considered it a failure, and would not do it again. Several members thought the searing blade used by Mr. Turner too small, and that this was the cause of his failure. Members would tail lambs at three weeks to four weeks old.

Port Elliot, August 21.

(Average annual rainfall, 20½in.)

PRESENT.—Messrs. W. E. Hargreaves (chair), Vince, Gurr, Brown, Pannel, Green, and W. W. Hargreaves (Hon. Sec.).

SALE OF CODLIN MOTH FRUIT.—Mr. W. E. Hargreaves read a paper on this subject. In his opinion the codlin moth could be kept in check if the Government would prevent the distribution of infected fruit. What encouragement was there for a man to try to

keep his garden clean when his neighbor was breeding thousands of moths to trouble him. He was satisfied they could get 90 per cent. to 95 per cent. of clean fruit if the man with a dirty garden was made to spray his trees and gather the infected fruit daily, or cut up his trees. This might seem drastic treatment, but what right has any man to breed moth to destroy his neighbor's fruit? The public were protected in various ways, and he thought the grower was entitled to some protection against the man who allowed the moth to breed unchecked. He believed every grower could keep his garden almost free from moth by spraying at the right time; pick up the fallen fruit daily, and destroy them by boiling. Another matter of great importance was the disinfection of second-hand fruit cases. He had killed as many as eight caterpillars in one box. Empty cases should be dipped in boiling water as soon as received. The apple house should be thoroughly cleaned at the end of the winter, and all shelves, boxes, &c., in it thoroughly scalded. When this has been done the house itself should be wetted inside with hot water. Further, the ground should be kept well cultivated and free from weeds. He was certain that, working under these conditions, he had 98 per cent. of clean fruit. He noticed that one large grower had stated the arsenate of lead could be used without fear of injury to the trees, and this was a great consideration, as some of the preparations which had been recommended burnt the fruit and leaves. The Government should not only stop the sale of wormy fruit, but also prevent its removal from the orchard. In the discussion which followed the majority of the members were opposed to the sale of codlin infested fruit being stopped.

SELLING FAT CATTLE BY LIVE WEIGHT.—Mr. W. E. Hargreaves read a paper on this subject. It appeared strange that the practice of selling fat cattle by live weight had not been adopted in this State. He was satisfied that sooner or later it would be the general practice, though perhaps another generation of stockmen and butchers may have taken the place of the present lot before the change is made. He understood that in many countries both fat and store stock were sold by weight. In his opinion it should be compulsory to have a weighing machine in every place where fat cattle were publicly sold. The butchers would strongly oppose such a proposal, and it was not difficult to see why. Their long experience in killing and dressing enabled them to make a fair estimate of the dead weight of sheep and cattle, while the scales would enable the farmer to accurately gauge the cash value of his animals. The weight-guessing competitions at the various shows illustrated how farmers often were in error in calculating the weight of the animals, and indicated the necessity for some better system than the present. The butcher being liable to err in his estimates, naturally errs on the safe side, and no one could blame him for looking after his own interests. It was certainly a very curious thing that valuable stock should be sold by guess instead of by weight, like all other agricultural produce. The cattle in this State were not wild, and there would not be any great difficulty in weighing them; the system only needed to be properly introduced to prove its fairness both to the buyer and seller. The subject is one of great importance to stockowners, and he hoped that it would be taken up by others.

MAGPIES.—The majority of members present considered that the common magpie should be taken off the list of protected birds, and a resolution to this effect was carried.

Woodside, August 31.

(Average annual rainfall, 31in.)

PRESENT—Messrs. W. Rollbusch (chair), H. Rollbusch, Freddie, Drummond, Fowler, Kleinschmidt, and Hughes (Hon. Sec.).

HORSE-BREEDING.—Mr. J. Drummond read a short paper on this subject. He thought sufficient attention was not paid to the selection of the mares for breeding purposes. The best mares of the type desired should be mated with the best stallion available. For all-round farm work he would mate them to a Clydesdale, and for saddle or trap work to a big blood horse. He thought a tax on stallions would be a good thing, as there would be a better class of horse travelled, and though owners of mares would have to pay a slightly higher fee, they would get full benefit from it. Members were agreed that it would pay to breed only from the best mares, and that for work on the farm or for sale they could not go far wrong in breeding Clydesdales. Several members stated that they had bred first-class horses for their trollies and vans by mating active draught mares to a good blood horse. The progeny was strong, active, and would stand any amount of work.

SOUTH-EAST DISTRICT.

Keith, September 1.

PRESENT—Messrs. Lock (chair), Makin, Mott, Morcombe, Fulwood, S. and P. Crouch, Davis, Witmitz, McLean, Goodhead, Camp, Draper (Hon. Sec.), and two visitors.

WHEAT-GROWING AT KEITH.—Mr. J. Lock read a paper on “Can we grow Wheat in the Desert, and How?” It was unfortunate that this part of South Australia had been named “the desert.” The impression conveyed by that term was waste land devoid of life and vegetation, and with little or no rain. Such a description did not, however, apply here; there was life and vegetation in abundance, water could be obtained over a large area at from 15ft. to 50ft. in depth, while the rainfall was reliable and averaged about 19in. There was big timber in many places, and good loamy soils which if properly worked would yield heavy crops. Then the mallee lands with the gum flats, which a few years ago were considered of little value, had been shown to produce wheat at a profit. There were tens of thousands of acres of this class of land within 10 miles of the railway which could be utilised, but the help of the Government was required in the making of roads. He thought that before building railway lines in new districts the Government should develop the country within short distance of existing lines. The first essential in the utilisation of this land was the destruction of the natural scrub and trees, as until this was killed right out on the land to be cropped they would not get the best returns. The main thing to aim at was to get a good burn when clearing; this was often difficult round Keith, as the country had often been burnt over to improve the feed. He would roll the scrub in winter or early spring to allow the shoots to grow again before burning. This would give the scrub a double check. Care should be taken to select a suitable day for burning, and precautions taken to secure a clean burn. For the first crop shallow working was all that was necessary. He would not crop the land the second year, but put it into fallow, ploughing somewhat deep. This would turn up some sour soil, but exposure to the air during the summer would sweeten it, while the small roots and other vegetable matter would decay and enrich the soil. Deeper ploughing would also pull up many of the stumps, and so assist in clearing the land. The practice of ploughing and sowing straight away land that had been in grass for two or three years was not to be recommended; bare fallowing would be found more profitable. They would also require to find out what was the best kind of manure to use. Most farmers here appeared to favour bone super., but he thought they should experiment in this direction. He had tried different quantities of manure per acre, but could not see any benefit from the application of more than 75lbs. per acre. Heavier applications might build up the land and improve the grass, but until they got rid of the shoots on the stumps he did not think it wise to use more manure. They should, however, experiment with different quantities of manures and watch the results closely. [The only satisfactory way to ascertain whether it pays to use heavier dressings is to sow equal areas of the same variety of wheat side by side with different quantities of manure and reap each plot separately. Estimates of yields are valueless when the difference of $\frac{1}{2}$ bush. per acre is equal to the cost of 40lbs. to 50lbs. manure.—ED.] Dealing with varieties of wheat, he had good results from Yandilla King, Federation, Purple Straw, and Clubhead. The first required to be sown early, as it was rather a slow grower; it stool'd well and gave a good return. Clubhead was the best for late sowing, as it grew quicker than any of the others, but did not stool, and should therefore not be sown early.” The paper was well discussed. One member suggested that the Branch should combine to have their soils analysed in order to find out what manures to apply. Mr. Stevens thought small experimental plots would give more satisfactory results. [Soil analyses cannot be relied upon as a guide to manuring. Experimental plots are the only means of ascertaining definitely which manure will give best returns.—ED.]

Kybybolite, August 26.

(Average annual rainfall, 22in.)

PRESENT—Messrs. Bradley (chair), Scott, Bail, Stapledon, Smith, Lacey, Hahn, A. R. and C. H. Scholz, Debney (Hon. Sec.), and several visitors.

Egg CIRCLES.—The Chairman called attention to the possibility of forming a circle here. After discussing the regulations, &c., six members promised to give their support, and arrangements were made for a meeting to be held.

FALLOWING.—Mr. C. H. Scholz read a paper on this subject, and at the outset, claimed that there were several good reasons for fallowing in this district. It enabled farmers to get the crop in in good time, and the soil benefited by exposure to the sun. Even on a small holding it should be quite practicable to fallow if it were done in a proper manner. If a farmer had 50 acres of fallow and sowed 10 acres of it with rape, he would get as much feed off the 10 acres as would have been realised from the 50 acres of grass, providing the fallowing was not done too early. He would recommend fallowing in September. He would plough to a depth of 4½ in., and would work it in the summer, so that it would get the full benefit of the air. On his own land bare fallow which had not been worked in the summer had done no better than newly-ploughed ground. One piece of land he had fallowed, sown with rape, scarified it after in the summer, and then, at the beginning of the season, had ploughed it again. The appearance of the crop now made him think the result would be very satisfactory, and he intended to follow the same plan this year. In the discussion which followed the general opinion was that fallow should be worked in the summer to allow sun and air to penetrate, and the advantage of fallow in facilitating seeding was appreciated by all. The past season has been a striking example of this. The Chairman emphasized the necessity for growing rape or some similar feed if the grass were ploughed in. One farmer present had reaped 20 bush. per acre last season from fallow that had not been worked in the summer.

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,300 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, North Terrace, Adelaide.

THE JOURNAL

BRARY

OF THE

26 APR 1911

Department of Agriculture OF SOUTH AUSTRALIA.

No. 4.

NOVEMBER, 1909.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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All communications to be addressed:

“The Editor, Journal of Agriculture, North Terrace, Adelaide.”

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E. H. COOMBE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

The Fruit Season, 1910.

Shipping companies are now approaching shippers offering space for the carriage of fruit during the coming season, and growers will be interested to have some idea of the boats likely to carry fruit. The following list gives the boats, probable sailing dates, and lines which it is anticipated will be carrying during the season :—

Sailing Date.	Boat.	Line.
February 15	Durham	Federal Houlder Shire
" 25	Osterley	Orient S.N. Coy.
" 25	Bremen	N.D.L.
March 1	Somerset	Federal Houlder Shire
" 2	Orestes	Holt
" 3	Malwa	P. & O.S.N. Coy.
" 5	Rostock	German Australian Coy.
" 7	Schwalen	N.D.L.
" 11	Orontes	Orient S.N. Coy.
" 14	Telamon	Holt
" 17	Moldavia	P. & O.S.N. Coy.
" 25	Konigin Luise	N.D.L.
" 26	Sarpedon	Holt
" 29	Ayrshire	Federal Houlder Shire
" 31	Mongolia	P. & O.S.N. Coy.
April 1	Westfalen	N.D.L.
" 2	Oberhausen	German Australian
" 8	Orsova	Orient Coy.
" 13	Hector	Holt Line
" 14	Marmora	P. & O.S.N. Coy.
" 22	Otway	Orient S.N. Coy.
" 26	Suffolk	Federal Houlder Shire
" 28	Morea	P. & O. Coy.
May 6	Omrah	Orient S.N. Coy.

During the next week or two the department will be making up its lists of the probable requirements of those intending to send their fruit for sale by the Commercial Agent, and growers should immediately communicate with the Government Produce Department so that suitable freight can be obtained, especially in view of the fact that applications for space in the Holt liners are due on the 11th instant. Inquiries addressed to the Manager, Government Produce Department, Adelaide, will receive immediate attention.

Trade with the East.

The Commercial Agent, Major A. E. M. Norton, has received instructions to proceed to the Philippines, China, and Japan for the purpose of reporting upon the possibility of finding markets there for South Australian produce. He intends to leave Adelaide on the 13th of November, and he will proceed to Manila, Hongkong, Shanghai, Kobe, and Yokohama. He expects to be away about four months. Since his return to South Australia from England, Major Norton has delivered 40 lectures to the producers in all parts of the State.

Sheep for Kybybolite.

Professor Angus, who visited New Zealand last month, was successful in obtaining some valuable English Leicesters and Border Leicesters for the Government farm at Kybybolite, where merinos have not been a success. The sheep were obtained at Christchurch in the Lincoln district, and the following were purchased from Mr. F. C. Murray—one four-tooth ram, one two-tooth ram, three special two-tooth ewe hoggets, and 38 ewe hoggets. The four-tooth ram is a particularly fine animal, and in the opinion of Professor Angus was one of the best on Mr. Murray's farm. Mr. Murray possesses a large flock, and as he does not exhibit his sheep at shows Professor Angus saw them in their natural condition. The two-tooth ram is only a youngster, but he promises to develop into a very fine animal. The three hoggets were selected from the first pick of Mr. Murray's flock, while the 38 were chosen from over 300 of his ewe hoggets. These were gone over very carefully and a lot were picked with a very uniform type of wool. These sheep, which should do particularly well in the South-East, are intended for the production of a first-cross or half-bred Leicester-Merino flock. In addition to the production of this first-cross the stud flock will also be kept going. In order to produce from these half-bred ewes fat lambs fit for the export market the following Border Leicesters were purchased at the Lincoln College, Christchurch—four ewe hoggets, one four-tooth ewe, and two ram hoggets. One of these rams was being prepared by the shepherd for the Christchurch show, where the College flock carried off the honors last year. He is a splendid young ram, and by next year should be fit to hold his own with any in South Australia. The ewe hoggets were also selected from those being prepared for the same show, and this fact is a guarantee that they are the best of the College flock. Professor Angus inspected the flocks of several other breeders in the district, and he came to the conclusion that he could not buy anything better than the sheep he had selected. They were shipped in their wool before he left Christchurch, and they are now on the farm at Kybybolite.

Smut on Barley Grass.

What has proved to be a new fungus, so far as Australia is concerned, has come to hand from Walloway. Mr. T. H. P. Tapscott sent, on behalf of Mr. P. Kain, some heads of barley grass affected with smut. Mr. D. McAlpine, Vegetable Pathologist of Victoria, has identified the fungus as *Tilletia hordei* (Koernecke), and says that hitherto it has only been found in Persia. Just how it was introduced to Walloway is a matter for conjecture.

Trial of Stone-gathering Machines.

The Minister of Agriculture, on the recommendation of the judges, has approved of the payment of £20 each to Messrs. W. Heithersay and J. C. Davies, and £10 to Mr. A. Burnham in connection with the trial of stone-gathering machines recently held at Paskeville. A further trial is to be held in February or March of next year.

The Lamb Season.

Killing operations are now in full swing at the works of the Produce Department, Port Adelaide, and up to October 31st 76,130 lambs, 14,711 sheep, and 182 hoggets, making a total of 91,023, have been put through, as against 113,200 to the same date last year. This is the latest season on record, and it is anticipated that last year's lamb figures will not be reached. The reason advanced for this falling-off is the fact of having such an extremely cold and wet winter. The lambs have grown, but have not matured, and in consequence there will be a lot of lamb unfit for export. Mutton purchasers were brisk in the earlier part of the season before shearing, but since then operations have been restricted, owing to most growers not realising the difference in values between the shorn and unshorn skins. It is anticipated that there will be further supplies of ewe mutton about the end of this month. Private slaughterhouses have dealt with 21,354 sheep and lambs, making the total of the State's output 112,377 carcasses.

A Port Broughton Weed.

Some months ago we received from Mr. T. E. Pattingale, Hon. Secretary of the Port Broughton Agricultural Bureau, specimens of a prickly perennial herb, common in that district, bearing yellow fruit, and known locally as the "Wild Tomato." According to Mr. Pattingale, the plant grows on the sides of sandhills where there is some drift, and is fond of fallow; on lay ground it does not grow so strong, and is more spindly, with a narrower leaf.

It dies down in the winter months and grows again in summer. It appears to be quite useless, as cattle will not touch it on account of the prickles. On examination it has proved to be a new species of *Solanum*, apparently localised in the Port Broughton district, where it has existed as long as the residents can remember. It has been described and illustrated by Mr. J. M. Black in the Proceedings of the Royal Society of South Australia under the name of *Solanum coactiliferum*, or "Felted Solanum." Its nearest neighbor among Australian solanums appears to be *S. esuriale*, which has a very poisonous reputation.

Contrivance to Catch Cocky Chaff.

The description of a simple yet effective contrivance for catching cocky chaff behind the harvester has been forwarded to us by the courtesy of Mr. W. Goldfinch, of Curramulka. Two light rails—about 10ft. long—are bolted on to the side beams of the harvester, parallel with the plane of the wheels and each other. Between these two rails, which project several feet behind the machine, a tarpaulin is suspended to form a sort of pouch or bag. It should be loose enough to contain a fair amount of chaff without being unwieldy; and of course must hang clear of the ground. When the wheat-box is full the wheat can be put on one side of the harvester and the chaff raked out at the back of the tarpaulin with a wooden rake and placed on the opposite side. By drawing the harvester into the same position between the wheat and the chaff each time the box is full the chaff can be put on the one heap. It is, of course, understood that the calmer the weather the more chaff will be caught and saved.

Decline of Peach Trees.

A correspondent at Lyndoch writes that a large number of his peach trees are dying off without any apparent cause, and he forwards some twigs. Mr. Quinn (the Horticultural Instructor) reports that some of the twigs are affected by gumming and shothole fungus (*Clasterosporium carpophilum*), but that he does not think the wholesale failure of the trees is due to this. "There are many peach, apricot, and almond trees," he says, "going off just now in other parts, and in nearly all cases it is where they are planted on stiff, clay subsoils. Of course, it might be 20 years before these peculiarly injurious conditions are again present to this extent. All I could suggest is to cut the trees back severely to try to stimulate fresh root action, and make the tops balance with the very evidently damaged and restricted root system. The only complete solution would be found in under-drainage of the land."

Streakiness in Butter.

In reply to a correspondent, who asks how to remedy streakiness in butter, the Dairy Expert (Mr. P. H. Suter) writes—"Streakiness in butter is due to many causes, such as (1) washing the butter when in the churn with water of too low a temperature; (2) uneven working-in of the salt; and (3) greasy butter tables." Mr. Suter recommends—(1) Washing the butter when in the churn with water at a temperature about six degrees below churning temperature; and (2) giving the butter a thorough working after adding the salt evenly as the table revolves. If on examination next morning the butter is streaky it should be reworked. "Uneven color or streakiness," adds Mr. Suter, "is due to nothing else but carelessness in manufacture."

Imports and Exports of Fruit and Plants.

The Inspectors under the Vine, Fruit, and Vegetable Protection Act of 1885 admitted at Adelaide during the month of September 6,563 bush. of fresh fruit, 1,485 bags of potatoes, 641 bags of onions, and 59 packages of plants. One hundred and ninety-two bushels of bananas were destroyed. The exports to inter-State markets consisted of 10,697 bush. of fresh fruit, 2,377 packages of vegetables, and 70 packages of plants, examined at Adelaide; in addition, 439 bush. of citrus fruits were passed at Salisbury, and 807 bush. of citrus fruits at Renmark. Under the Commerce Act, 407 bush. of fresh fruit, 28 packages dried fruit, and 76 packages of preserved fruit were exported. These were distributed as follows:—For New Zealand, 414 bush. citrus fruits, 25 packages dried fruit, and 25 packages preserved fruit; for India and East, three cases oranges, 51 packages preserved fruit, and three packages dried fruit. Under the Federal Quarantine Act 101 packages seeds, bulbs, &c., and two packages of plants were admitted from oversea ports.

Destructive Insects of Victoria.

We have received from the Victorian Department of Agriculture a copy of Part IV. of the "Handbook of the Destructive Insects of Victoria," a work on which Mr. C. French, F.L.S., F.E.S., the Victorian Government Entomologist, has been engaged for some years. The part now issued runs into nearly 200 pages, and deals with 20 insects and 14 insectivorous birds, making a total of 98 insects and birds that have been described and illustrated up to date. In the preface it is pointed out that the insects attacking our forests have been given a prominent place in Part IV., because of the ever-increasing importance of trying to prevent the destruction of our valuable timber forests. The book is full of valuable information respecting the insect pests and

methods of combating them, and there are some interesting facts published in the descriptions of the insectivorous birds. The illustrations of birds, insects, and parasites are remarkably good and add considerably to the value of the book, a copy of which should be in the library of every orchardist and gardener.

Cost of Spraying Apple Trees.

A bulletin recently issued by the Nebraska Agricultural Experiment Station deals with the question whether from the point of view of the practical fruit-grower it pays to spray apple trees for apple scab and codlin moth; that is, whether the increase in the yield and the improvement in quality pay for the trouble and expense of spraying. It was felt that the proper way to determine the question was to spray in various orchards in many districts over a series of years, so as to obtain results both when the crop was heavy and light, and also when prices were high and low. Trials have so far been made in two years, and spraying has given profitable results in all the orchards in which it was tried. Two orchards were dealt with in 1907, a portion in each being left unsprayed for comparison. Several sprayings were made, Bordeaux mixture and Paris green being used at the beginning and arsenate of lead at the end. The cost of the material used and of the labor worked out to less than 1d. per gallon in each orchard, but in one $2\frac{1}{2}$ gallons. per tree were used in the course of five sprayings, and in the other 15 gallons. per tree were applied in four sprayings. The cost per tree in one was 1s. 8d. and in the other 1s. $2\frac{1}{2}$ d. In one orchard 71 sprayed trees yielded 251 bush. worth £42, or 11s. 10d. per tree, while 30 unsprayed trees produced 53½ bush. valued at £4 12s., or 3s. 1d. per tree. In the other orchard 20 sprayed trees yielded 80½ bush. worth £16 3s., or 16s. 2d. per tree, while 10 unsprayed trees yielded 19 bush. worth £2 2s. 4d., or 4s. 3d. per tree. Spraying not only increased the yield of fruit, but improved the quality. Thus, in one orchard, fruit of No. 1 grade constituted 44.9 per cent., and in the other 61.8 per cent. of the entire crop, on the sprayed trees, while the unsprayed trees only gave 4 and 22.4 per cent. respectively of the best quality fruit. The net gain per tree, after deducting the cost of spraying, was 7s. 1d. in one orchard and 10s. 8d. in the other, which is equal to a difference of £20 per acre.

Sale of Impure Sulphate of Copper.

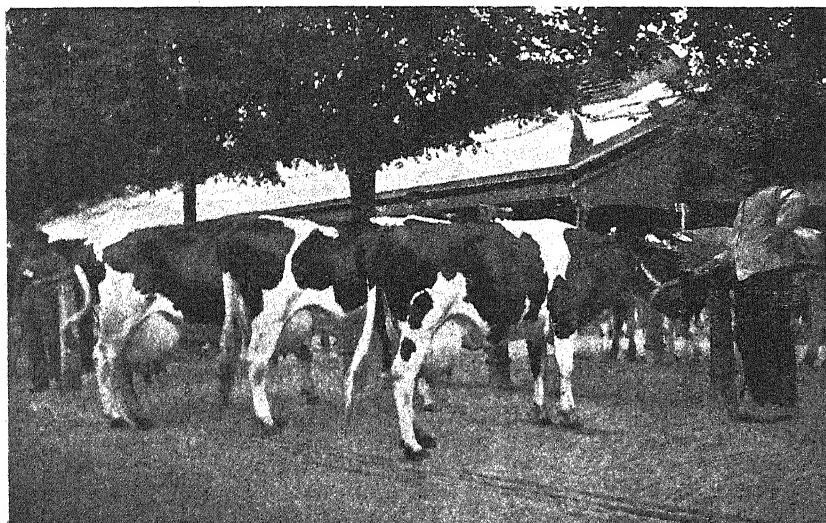
The Board of Agriculture and Fisheries have on several occasions drawn attention to the importance of using pure sulphate of copper when making Bordeaux mixture, or when using it either for the destruction of charlock, for dressing wheat, or for the cure of foot-rot in sheep. In purchasing it

care should be taken to demand a product of 98 per cent. purity, while the article offered as "agricultural" sulphate of copper should be scrupulously avoided. The usual adulterant is sulphate of iron, which is much cheaper. An easy test for the presence of iron in sulphate of copper is to dissolve a little in water and add ammonia, constantly stirring until a deep blue liquid is formed. Any quantity of brown flocks floating about in this blue liquid indicates the presence of so much iron that the sulphate of copper should be subjected to a proper analysis before use. During the past year the Board have had evidence that impure sulphate of copper continues to be sold in considerable quantities. Early in 1908 the Crown Agents for the colonies stated that certain wholesale chemists, in executing an order for sulphate of copper for the Agricultural Department of one of the Crown colonies, sent sulphate of iron containing about 10 per cent. copper sulphate; and that, in reply to the representations of the Crown Agents, they stated that this was the usual article supplied under the designation of sulphate of copper for agricultural purposes. In consequence, 18 samples were purchased by Inspectors of the Board from chemists in different parts of the country. Of these 12 were commercially pure blue vitrol or sulphate of copper. In two cases the description sulphate of copper or blue vitriol was applied to articles containing 51·5 and 39·2 per cent. respectively of sulphate of iron. In these cases the Board directed inquiry to be made with a view to prosecutions under the Merchandise Marks Acts. One sample described as powdered vitriol contained 78·6 per cent. of sulphate of iron, and was colored with Prussian blue. Another sample described as vitriolised wheat dressing contained 66 per cent. of sulphate of iron, and two other samples sold under a fancy name contained 76 per cent. and 56 per cent. respectively of sulphate of iron. It is evident, therefore, that farmers should exercise considerable caution in purchasing sulphate of copper.—*The Journal of the Board of Agriculture.*

Government Inspection of Netherlands Cattle.

The Government have received from the Consul-General for the Netherlands a publication respecting the official testing of breeding cattle destined for exportation. The official notice states—"In order to maintain and to enhance the high reputation which the Netherland breeds of cattle possess in different parts of the world, the Netherland Government have promulgated a measure which may also interest those who desire to import breeding cattle from that country. By Royal decree of September 11th, 1908, this Government gives facilities for the official inspection of cattle destined for exportation, with a view to obtaining an official statement, if warranted, that such animals

are sound and suitable for exportation. The testing will be carried out with great care and accuracy by experienced veterinary surgeons detailed for this work by the Government and according to the regulations established by the Minister of Agriculture, Industry, and Trade. The tests will be supervised by the Director of the State Serum-Institute at Rotterdam. As a rule the official testing will include—(1) Clinical examination with regard to contagious and other diseases; (2) the tuberculin test for the detection of tuberculosis. Whereas, however, in some countries the tuberculin test is considered to be of little value, the latter may be omitted in cases where the foreign buyer of the animals raises an objection to it. From the above it is evident that any foreign cattle-breeder who intends to import breeding cattle from the Netherlands is enabled by this decree to secure the highest guarantee that he will receive perfectly sound animals by requiring that they must have passed the Government test and that with them should be produced an official certificate of such test. An importer should also state whether he wishes the animals to be subjected to the tuberculin test or not.” The two principal breeds of cattle in the Netherlands are the Holland and the Friesian. A picture of three Friesian Herdbook cows is given below.



FRIESIAN HERDBOOK COWS, HOLLAND.

SUPERINTENDENT OF AGRICULTURE IN THE SOUTH-EAST.

The Government have appointed Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S., of the Victorian Department of Agriculture, to the position of Superintendent and Instructor in Agriculture in the South-East and Manager of the Kybybolite Experimental Farm. Mr. Colebatch will begin his new duties on November 16th, and during the absence of Professor Perkins next year he will take charge of the Roseworthy Agricultural College.



MR. W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.

Mr. Colebatch has had an exceptionally wide course of training in agriculture, &c., during his career—has had practical experience of the different systems of farming in vogue in South Australia, Great Britain, New Zealand, and Victoria. He received his primary and secondary education at Prince Alfred College, South Australia, and whilst at that institution he passed both the junior and senior public examinations. In 1895 he won a Government scholarship valued at £90, and entered the Roseworthy Agricultural College. During the three years that he spent at that college he had the privilege of

studying under Professor Lowrie, the present Director of Agriculture in Western Australia. Mr. Colebatch secured the Angas gold medal, silver medal, the College diploma, and various class prizes, and also a special prize for practical farm work. At the conclusion of this course he proceeded to Scotland and simultaneously undertook the agricultural science course at the Edinburgh University, and the full curriculum (four years) of the Royal (Dick) Veterinary College, Edinburgh. In four and a half years he obtained his B.Sc. degree, in agriculture, and also the diploma of the Royal College of Veterinary Surgeons of Great Britain. He was medallist in chemistry and economic entomology, and gained honors certificates in agriculture, rural economics, forestry, engineering, field work, and first class certificates of merit in botany and natural history. Before leaving Scotland he was appointed by the Board of Governors of the Canterbury Agricultural College, New Zealand, as Lecturer on Veterinary Science and Entomology, and during the three and a half years he was attached to the staff of that college he had frequently to take control of the field operations and to direct the farm practice.

While in New Zealand he received an offer of the professorship of agriculture in South Australia, but was precluded from accepting it owing to an agreement with the Board of Governors of the Canterbury Agricultural College. Two years ago Mr. Colebatch was appointed to the staff of the Victorian Department of Agriculture, and since then he has been occupied in carrying out responsible agricultural and veterinary work throughout that State.

His duties in Victoria have comprised—1. Administration of the Milk and Dairy Supervision Act as Assistant Chief Veterinary Officer. 2. Control of experimental and demonstration plots for the growth of fodder and other crops. 3. Lecturing on agriculture at the Burnley School of Small Farming. 4. Lecturing on agriculture to the agricultural science students at the University of Melbourne. 5. Lecturing on agriculture and veterinary science to the agricultural classes and societies. 6. The examination of live stock, including the inspection of stallions for soundness.

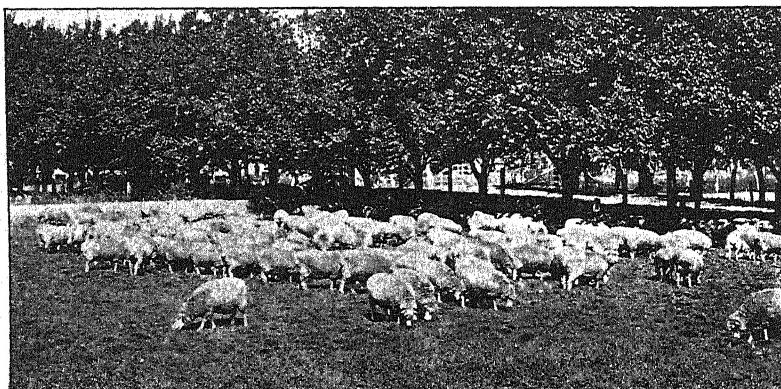
In the course of his successful educational career and in the discharge of his duties in Victoria and New Zealand Mr. Colebatch received a large number of excellent testimonials. The following extracts from some of them will give some idea of Mr. Colebatch's qualifications for the position to which he has been appointed :—

It was my intention when Minister of Agriculture to establish an Agricultural College in southern Victoria, and it was definitely arranged for Mr. Colebatch to take the principalship of the new institution. This position I am confident he would have filled with great credit. The erection of the college was, however, delayed for a time.—HON. G. SWINBURNE, late Minister of Agriculture in Victoria.

From a close personal contact I feel sure that Mr. Colebatch has a wide range of agricultural knowledge and a firm grasp of the problems connected with agriculture in Australia. His success as a lecturer also indicates the marked ability he possesses of imparting this knowledge and of exciting enthusiasm in others.—DR. CHERRY, Director of Agriculture, Victoria.

Since he came here, now nearly two years ago, Mr. Colebatch has done excellent work. He is to me a strong right hand man, being able, when needed, to take my place in superintending the practice on the farm, and I shall be sorry to lose him from the staff. In the College he is successful as a lecturer, and in his veterinary practice in the neighborhood he is appreciated very highly. Mr. Colebatch's knowledge is in no way second hand, and it will, accordingly, command respect among practical men. I consider the double qualification—agriculturist and veterinary surgeon—fits him exceptionally well for high office in an agricultural department.—PROFESSOR LOWRIE, M.A., B.Sc., Director of Agriculture, Western Australia.

Mr. Walter J. Colebatch was a highly distinguished student in the graduation course for B.Sc. in agriculture of this University. He has taken all advantage of a wide and comprehensive course of training in agriculture and the associated sciences. In addition, he is thoroughly practical, and he possesses personal qualities in an eminent degree which foreshadow high distinction as an organiser and teacher. I have every confidence in recommending Mr. Colebatch in the strongest possible terms for a position of trust and responsibility.—PROFESSOR WALLACE, Professor of Agriculture and Rural Economy, University of Edinburgh.



DESTRUCTION OF LOCUSTS.

By W. L. SUMMERS.

In accordance with the instructions of the Minister of Agriculture I visited Wilmington and Orroroo during the second week in October in connection with the locust problem, a paragraph in the press having stated that the young hoppers were swarming in great numbers in the locality of the latter town. In order to carry out experiments in locust destruction a supply of locust fungus was obtained from the Victorian Department of Agriculture, and in addition a quantity of arsenite of soda was prepared.

On arrival at Orroroo I arranged with Mr. M. Shannon, the clerk of the local district council, to propagate the fungus and also to drive me around at the end of the week. I went on to Wilmington the same evening, and next day made a careful search for locusts along the main stock road to Quorn. A number of farmers were visited, but in no case had they noticed locusts in any considerable number. The young hoppers—about the size of the ordinary housefly—were found in several places along the road, and in one locality, about seven miles out of Wilmington, they were comparatively numerous. On the park lands around Wilmington we found them scattered thinly in several parts, but there does not appear to be any danger of serious injury occurring this season. I left a supply of fungus with Mr. Lawson, jun., and arranged to have this distributed in the swarm on the stock road. A quantity of arsenite of soda was also left to be used in an enclosure should the locusts appear numerous later on.

At Orroroo Mr. Shannon drove me along the stock road as far as Walloway. Although the locusts were reported to be numerous under every tuft of grass in Orroroo a careful search in the vicinity failed to locate them in numbers. On the park lands and recreation ground there were a few here and there, but not sufficient to warrant anything being done. In places on the stock road several miles north they were fairly numerous, while at Walloway the thickest swarms were found. Unfortunately these were not in places where stock could be kept off, and under the circumstances I did not feel justified in using the arsenite of soda.

Speaking with a number of farmers I gathered that the locusts were either late in hatching out or were not going to be numerous. Judging from appearances, the crops and grass will be too far advanced for the locusts to do much harm this year in this locality. I was informed, however, that they were very plentiful towards Johnburgh and Bendleby, but time did not permit of an inspection. Owing to unforeseen circumstances I was unable to distribute

the fungus, but arranged with Mr. Shannon to do so on the stock road near his residence. With the locusts so scattered, and the weather so dry, I fear there is not much chance of the fungus doing its work. A quantity of arsenite of soda was also left with Mr. Shannon, who will undertake experiments, and I have made arrangements for a farmer in the vicinity to carry out similar work should the locusts become more numerous.

So far as I can gather, the local habits of the locusts are as follows :—The flying locusts in November and December seek out the firm bare patches in the pasture land and deposit their eggs in a nest, if it may so be termed, about an inch in depth. They rarely deposit on grassed land or on cultivated soil or stubble. The eggs are laid in masses in an envelope or pod in the holes. American authorities state that a well-developed female locust will lay from 100 to 150 eggs, according to the species. With some kinds all the eggs are laid in the one hole ; in others they may be deposited in two or three holes. Early in the spring—August to September—the hoppers usually hatch. This year, however, they are only just appearing. The hoppers, which are no larger than a small housefly, usually keep in the thin grass at the edge of these bare patches, feeding on the succulent vegetation. At first they are very scattered ; but when about a couple of weeks old they congregate in thick masses and advance through either pasture or crop, and no doubt at this stage most success is likely to be achieved in any operations which may be undertaken to destroy them. Later on, when they reach the flying stage, they move freely from place to place, and attack almost anything green that is available.

The questions naturally arise—Can anything be done to keep them in check ? and do they cause sufficient injury to warrant any serious action ? Residents of the lower north and south, who only see the insects in numbers at long intervals, will probably find it difficult to realise that the locust problem is one of the most serious difficulties that the farmers of the districts north and east from and including Orroroo have to face. One landholder told me that he feared their ravages far more than he did the effect of a dry season. Last year the locusts were exceedingly destructive throughout this district, and caused very heavy losses. It is estimated that the wheat crops were reduced by fully 2bush. per acre, and as the area under cereals in the district councils of Orroroo and Carrieton was about 90,000 acres this represents a loss of £30,000, taking wheat at 3s. 6d. a bushel. Further, the dairying industry received a sad check. Not only was most of the prolific growth of herbage destroyed, but what was left was so tainted that stock refused to eat it. The production of cream immediately fell off at least 50 per cent., and those who should be in a position to form a fairly accurate estimate state that the losses to the dairying industry were equally as great as, if not greater than, that to the wheat. If these figures can be accepted, then leaving out the country further north—and the locusts are reported to have been destructive

up as far as Hawker—we have one year's loss totalling over £60,000, and it seems to me that this warrants some definite action by the Agricultural Department. So far as the crops and grass are concerned, most of the damage is done by the locusts which hatch in the immediate neighborhood. Usually, the flying locusts arrive too late to do much injury, though this is not always the case. The locust will undoubtedly be a big factor in the failure or success of the Pekina Creek Irrigation Scheme. Should they appear

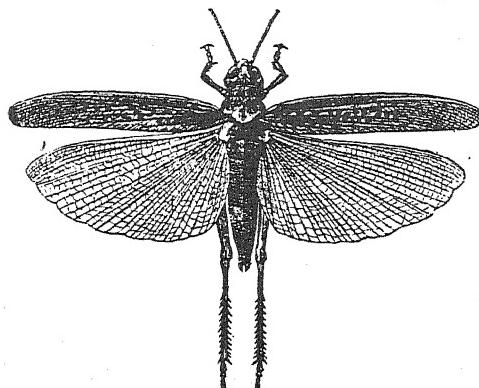


FIG. 5.—Rocky Mountain Locust—female.



FIG. 6.—Rocky Mountain Locust—male.

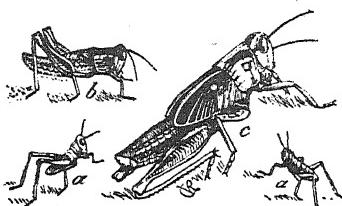


FIG. 7.—Rocky Mountain Locust; different stages of growth of young.

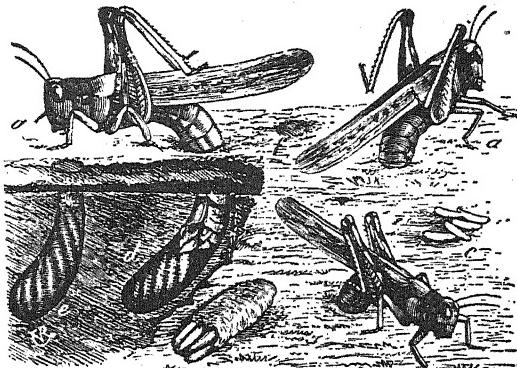
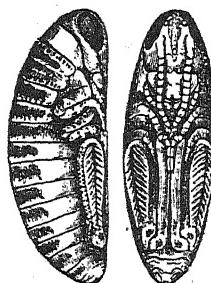
FIG. 8.—*Melanoplus spretus*, laying eggs.—[After Riley.]

FIG. 9.—Young locust just before hatching.—[After Riley.]

LIFE HISTORY OF ROCKY MOUNTAIN LOCUST.

The general habits of the South Australian species are similar.—Illustration from *Nebraska Bulletin*.

next season as numerous as they were last year it will be a poor lookout for the settlers, as these irrigated blocks will, in October and November—when there is little other succulent growth available—prove an irresistible attraction to the locusts. The large sum of public money invested in this scheme is another argument in favor of definite action by the Department.

In regard to methods of locust destruction, we have the benefit of the experience of South Africa, and especially of Natal. The locust problem in South Africa is a national one, and the enormous losses have caused the Governments of the respective States to form a South African Locust Bureau, with a view to co-operative work and experiment and to secure all available information on the subject. The British colonies of Cape Colony, Natal, Orange River, Transvaal, Southern Rhodesia, Basutoland, Swaziland, and Bechuanaland, the Portuguese colony of Mozambique, and the German West African State are co-operating in this matter. The first report of the Committee of Control of the Bureau contains the following important statement :—“ The chief measure of control is in the destruction of locusts in the wingless or ‘voetganger’ stage, and this Conference urges upon the Governments of the various colonies and territories to take steps to make the ease and low cost of destroying locusts by the sweetened arsenical solution universally known to farmers in locust-infected regions. Further, this Conference wishes to add that, from the experience of the members composing it, despite the highly toxic properties of the solution very little danger has resulted or is likely to result from the general adoption of this treatment to poultry, stock, or man.”

Numerous methods of coping with the locusts have been tested in South Africa. These include the use of locust fungus, the destruction of the eggs, capture of flying locusts and also the hoppers or “voetgangers,” destroying the hoppers by driving stock over the swarms, beating with bushes, spraying with paraffin oil, soap, sheep-dips, &c. The most effective method of all has, however, been the spraying of the herbage upon which the swarms are feeding with a sweetened arsenical solution. Some idea of the magnitude of the trouble may be gained from the statement that in Orange River Colony 2s. per bag was paid by the Government for all locusts gathered while in the hopping stage, and in one season 6,000 tons of these locusts were paid for. In Cape Colony 700 spray pumps and a large quantity of arsenite of soda were issued in 1906 to farmers; in Orange River Colony 5,000 spray pumps and 40 tons of arsenite of soda were ordered; in the Transvaal several thousand pumps and 60 tons of poison were available; while in Natal operations by the Government were on an equally extensive scale.

Natal has been foremost in the work of locust suppression, and drastic legislation has been enacted to secure united action in this work. Shortly, this legislation provides for the appointment of locust officers; makes it compulsory for all occupiers of land to report to the nearest officer when and where locusts are depositing their eggs on his land, and also when they hatch out, and, further, to use his utmost endeavors to destroy the locusts by the methods advised by the Agriculture Department. Penalties are provided for neglect to carry out the law, and the Department may, if its instructions are not carried out, take such steps as may be considered necessary, and may recover the cost of the same from the occupier of the land. Similar legislation is in force in the Orange River Colony and some of the other States.

The arsenical solution recommended for use against the hoppers is made as follows :—

Arsenite of soda	1lb.
Sugar or treacle	2lbs. to 4lbs.
Water	8galls. to 16galls.

The arsenite of soda may be dissolved in either hot or cold water. If suspended in some open material just below the surface of the water it will dissolve more readily. This solution is used at 1lb. arsenite to 16galls. for very young hoppers, at 1lb. to 12galls. up to five weeks of age, and 1lb. to 8galls. when the wing pads are well defined. With very young locusts the solution is sprayed amongst them on the grass, &c., which they are eating or about to eat ; when on the move, a strip of grass along their front is sprayed. A fine spray on the grass—not a drenching spray—is required. Spraying should be done when the locusts are camping at night, or early in the morning before they become active.

With regard to the danger of poisoning stock, the risk is found to be very small, and the very few instances of such having occurred have been traced definitely to almost foolish negligence. If the solution is applied as recommended, it is very difficult for a beast to acquire a noxious dose. Fowls, pigs, and horses have gorged themselves on the poisoned insects without ill effects. Analysis has shown that 36lbs. of grass freshly sprayed with the strongest solution recommended will contain sufficient arsenic, if eaten at one time, to kill a young calf, and 72lbs. an ox. It is therefore recommended that all animals should be kept off the sprayed areas until the arsenic has burnt the grass and caused it to die, or until a heavy rain has washed it off.

It should be mentioned that the arsenite of soda is readily soluble in water, and while it burns the grass where it is applied it is washed into the soil by the rain, and at the strength recommended and in the quantities used it can do no injury to the ground. Insoluble arsenical compounds like arsenate of lead would not injure the grass, but their toxic properties would remain for a long time ; hence they should never be used on the pasture. For fruit trees, vines, roses, &c., the arsenate of lead may be used with advantage as a protection against the locusts.

As to the possibility of dealing with the locusts under local conditions, I believe losses could be reduced to a minimum by concerted action on the part of the occupiers of infested country. This, however, could only be secured by legislative action on similar lines to that of Natal, and for such legislation we have precedents in the Acts dealing with the destruction of rabbits, sparrows, and weeds. It may be objected that this work could not be profitably undertaken in the outside pastoral country, and this is correct ; but I believe that if the swarms hatching in the northern hundreds were dealt with those that may come from the outside districts would in most seasons do very little damage, and in any case the crops and the grass would be too far advanced to suffer much injury.

EGG CIRCLES.

Twenty-one egg circles have now been established at the following towns :—Clarendon, Tantanoola, Tanunda, McLaren Vale, Kybybolite, Yorketown, Millicent, Plympton, Auburn, Roseworthy, Mount Barker, Gawler, Riverton, Naracoorte, Kadina, Mannum, Georgetown, Crystal Brook, Normanville, Orroroo, and Kalangadoo. They represent a total membership of about 550, and the list of members is growing daily. A compliment was paid to South Australia in that the Victorian Government sent their poultry expert, Mr. H. V. Hawkins, to this State last month to inquire into the working of the egg circles system, and by direction of the Minister of Agriculture he was supplied with full information by Mr. A. E. Kinnear, the organiser of the egg circles. The result will probably be that he will recommend his Government to adopt the system in Victoria.

THE OUTLET FOR EGGS.

The Commercial Agent furnishes the following information respecting the evils which it is intended to overcome by the adoption of the egg circles system, the chief object of which is to find an outlet for eggs in the flush of the season :—"In 1894 the price of eggs at no time between September and the end of December, which is the glut season, exceeded 4½d. During October of that year the price was as low as 3½d. in Adelaide, and off that had to come 5 per cent. commission. The market reports in that year said that the cause of the slump in the price was that the supply exceeded the demand. Later the export trade to the eastern and western States was developed, with the result that in 1902-3 for the same months of the year eggs went up to 9½d. a dozen. Then, naturally, production increased. In 1905 we found we were exceeding the demands of the Commonwealth, because the price receded again to 5½d. a dozen in those months. In 1906 it looked very much as if we were going back to the price of 1894, and it was then suggested that we should open up an export trade to England, the Government undertaking to guarantee the freight. The result of that shipment to England was 6½d. a dozen net in Adelaide. Prior to that it was considered highly satisfactory by many people in the trade here if we got never less than 6d. a dozen in Adelaide for the inter-State trade during the glut season. In 1907 two further shipments went to London and netted in Adelaide 7½d. a dozen. Several people, however, who shipped that year were dissatisfied because they only netted 7¼d. and the local price was 8d. Their idea was that had they kept their eggs instead of shipping them to London they would have got 8d. a dozen, evidently losing sight of the fact that it was the result of shipping the surplus outside the

Commonwealth that made the local price. In the following year, September, 1908, I cabled a firm offer of a price that would have netted 7d. a dozen in Adelaide for 30,000 cases of eggs. None was shipped, and the reason given was that the local price being good persons would not ship with the prospect of getting only 7d. The point to be looked at is this—the man who shipped to England would be making the price for the man who did not. Supposing we had shipped the 30,000 cases off the South Australian market during the month of November, is it not reasonable to believe that the local price would have been nearer 1s. than 8d., and in addition to that there would have been at least £30,000 of outside capital brought into the State? We have, therefore, arrived at two conclusions—(1) that as individuals we cannot ship to England; and (2) that if production is to be increased here the export trade must provide an outlet for our eggs. Hence the reason for starting co-operative circles throughout the State, so that every year export to oversea markets can be carried on by each circle taking its proportion of the export to England, and thus keeping up a satisfactory price locally, without resorting to the pickle tub."

AN EGG CIRCLES CIRCULAR.

It is the intention of the organising secretary of the Egg Circles Branch to issue once a month to the members of egg circles a circular or small paper bearing on points connected with the poultry industry. The first paper has been published and sent to members, and it deals with the question of securing infertile eggs during the coming hot weather. The advice given is as follows:—

The summer is about here, and unless you take steps to prevent it we shall begin to have the bad eggs coming in. With the system that is in operation we will not find nearly so many bad eggs as are found in the ordinary market article, but it is possible to so work the business as to have no bad eggs at all, even in the hottest weather. All that is necessary is to kill, sell off, or separate the roosters from the hens, and then the eggs will be infertile. Being infertile they will keep longer, and are the best eggs for our purposes. As you all know, the Circle business is being steadily built up on the foundations of size and superior quality. The graders at our depôts will attend to size, but you members must see to the quality and freshness. Here are a few points:—

1. The roosters worry the hens; without them the hens will lay 10 per cent. better.
2. The roosters eat the profits the hens make.
3. The roosters fertilise the eggs, causing them to germinate and quickly go bad in hot weather. It is believed that the sum of £50,000 is lost every year in South Australia through crude methods of handling, and running roosters with the hens. What is your share of this loss?
4. Miserable and weedy cockerels are allowed to breed and beget equally feeble progeny. Why not stop such bad business?
5. A strong rooster will get up to 1,000 chicks in the year. Even on a big farm three or four roosters of this sort would be plenty. Six or eight of the best layers should be picked out for each cock and penned separately, and then the future stock would be all right, and the eggs from the other hens would be infertile.
6. The young cockerels should be sold off as soon as they are about five months old. After this age they will get chickens, and also eat the profits the hens make.

The papers issued will fit the time of the year, and every point connected with poultry and egg production will be dealt with. By those means it is expected that the members will in a short time become educated with respect to the possibilities of poultry-keeping under intelligent management.

SOUTH AUSTRALIAN PRODUCE IN LONDON.

The Grocers' Exhibition.

South Australian produce received an excellent advertisement at the Grocers' and Allied Trades' Exhibition which was opened by the Hon. A. A. Kirkpatrick on Saturday, September 18th. The advantages of exhibiting at special exhibitions rather than at general exhibitions were pointed out to the Government by the Commercial Agent (Major Norton), and his suggestion in this respect has apparently been justified by results. In a letter to the Treasurer respecting the Exhibition Mr. Kirkpatrick writes — "The South Australian exhibit covers a space of 50ft. x 16ft. and is a very striking and excellent display of the State's products. The Acting Commercial Agent has shown taste in the selection of the design for the stand itself and in the arrangement of the exhibits. The State is to be congratulated upon the very effective manner in which the products to hand have been arranged so as to make the most comprehensive display possible. I feel sure that an effective exhibit such as the one in question at shows such as the Grocers' and Allied Trades' Exhibition cannot but be beneficial to South Australia as an inducement to suitable persons to settle there as well as an advertisement to the grocers and allied tradesmen of the resources of the State." Mr. Kirkpatrick also forwarded a number of press cuttings respecting the Exhibition. These include reports in the leading London papers and the principal newspapers at Manchester, Newcastle, Nottingham, Leicester, Glasgow, Ipswich, Cardiff, Edinburgh, Bradford, and Bristol, in all of which special reference was made to South Australia. The following extracts are specimens of what most of the papers had to say :—

It is significant that the South Australian Government has an important and representative display at the hall. Their show is so effective in its range of samples, from tallow to brandy, that the Government will certainly reap its reward. It is not generally known that South Australia has beaten the Continental brandies in open contest. In fact, as a representative of its Government informed the *Morning Leader* representative on Saturday, at the opening of the Exhibition, South Australia produces as much as half of the wine output of the Commonwealth. In the season just ended the production was over three million gallons.—*Morning Leader*, London.

The South Australian Government has taken a large space and erected a most attractive pavilion, in which the products of that colony are displayed. Within recent years the colonies have appreciated more and more the value of exhibitions in enabling them to put forward their advantages. South Australia appears to have plenty to offer the grocer, and at this Exhibition she puts it forward in a most attractive way.—*Daily Mail*, London.

The principal point emphasised at the luncheon which preceded the formal opening of the Grocery, Provision, and Allied Trades' Exhibition at the Agricultural Hall, Islington, on Saturday afternoon was that made by the Hon. A. A. Kirkpatrick, representing South Australia. He emphasised the fact that our Australian colonies were able for many years to come to solve the problem

of the food supply to the mother country. Wines, brandy, fruit, oil, rabbits, and wheat abounded, and, now that the question of transportation had been overcome, that part of the Empire was ready and able to provide food for the teeming millions of England. As usual, the Exhibition itself, which remains open until Saturday next, is full of interest both to the grocery and allied trades, and to the housekeeper who is anxious to learn the latest and best things to help in the everyday question of providing for home requirements.—*Leicester Post.*

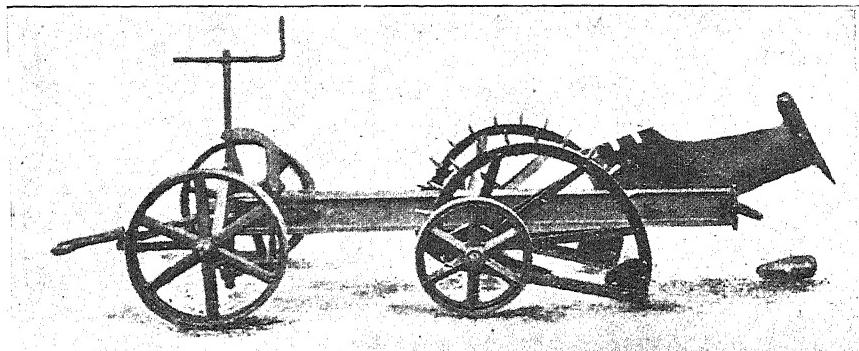
The Government of South Australia, which is showing the resources of that portion of the Empire in furnishing the mother country with such splendid foodstuffs and beverages, is doing a commendable educational work.—*Standard*, London.

The Acting Commercial Agent (Mr. G. A. W. Pope), reporting on the Exhibition, says:—"The value of the stands to business people can be gauged by the crowds that attend, a large percentage of whom are grocers from all parts of the Kingdom, and just the class of people our exhibits would interest, and, judging by the very many inquiries, was interesting a fair proportion of those present. A fair criterion of the distances people come may be obtained when I mention that I arranged with one of the biggest people in Belfast to send them some apples I had on show, with the idea that they would exhibit them in their windows at the present time, and open a trade in South Australian apples through this department next season; and a little later I interviewed a man from Cardiff who is interested in the honey trade we have established here. Particulars of the produce shown are as follows:—The shelves of one section were filled with a collection of wheats and flour in glass jars, which contained good samples of the best wheats grown in South Australia. Messrs. D. & J. Fowler were kind enough to send two 56lb. trade cases of first-grade raisins from their London store, so I used these and an advertisement card of the firm for the purpose of informing inquirers where raisins could be obtained. I sold 1,000 pots of honey to the public at 6d. each, and obtained the supply from Messrs. Sainsbury, Whiteley, and the Junior Army and Navy Stores, and as our wholesale agents opened up a good many new accounts, this side of the business was successful. The remainder of the stands were filled with pictures, shells, horns, wattle-bark, tallow, and tinned rabbits, the Franco-British trophy, olive oil, and miscellaneous things held in stock in this office. I may mention that I also exhibited a honey toffee which is now being made by Mr. Butterworth, of Manchester, and consists of 25 per cent. of South Australian honey, the balance being sugar. This is a really good wholesome toffee, and he hopes to extend his trade in it to London. There were very many inquiries from the public respecting South Australia, and we distributed 500 handbooks and other literature giving the particulars generally asked for. In this respect particularly, and throughout the Exhibition generally, I have had the assistance of the Secretary to the Agent-General, and I feel sure that the sum expended has gained a very splendid advertisement for South Australia and its products."

A MOLE-DRAIN PLOUGH.

While he was in New Zealand last month, Professor Angus visited most of the implement and machinery firms in Dunedin, Christchurch, Wellington, and Palmerston North, and at the last-named town he purchased a mole-drain plough, so-called from the fact of the resemblance of the hole it leaves in the ground to the burrow of a mole. This plough is now landed in the State, and will shortly be at work in the South-East.

Drain ploughs have been used with excellent results in many parts of New Zealand during the last few years. Thousands of acres of cold clay country



CARLYLE MOLE-DRAIN PLOUGH.

have been reclaimed by them and converted into fruitful agricultural and pastoral land, capable of cultivation at any season of the year, and with largely increased sheep-carrying capacity. No cheaper or more expeditious system has ever been devised for subsoil draining heavy water-logged soils. The plough is worked by horses (10 to 12 in a team) or by traction engine, and drains can be laid at a cost of 1d. per chain, or even less. In suitable soil, the drains will stand for many years, effectually freeing the surface of storm water and winter accumulations.

These figures show clearly the method of operating. In fig. 1 the rear end of the plough has been raised on the wings by the forward motion of the team high enough to allow the sheath to drop into its working position, where it is locked by a cross-latch, and the point is now entering the ground. In fig. 2 it has taken the ground, and is working at the desired depth. In fig. 3 the latch has been thrown out, and the sheath has risen to the surface, in which position the plough is drawn back to a fresh starting-point. A

slight pressure on the starting-lever by the driver suffices to bring the wings into action when required, and the plough into fig. 1 position again. The sheath can be set to work at any desired depth, and the level can be altered a few inches up or down while the plough is in motion. The plugs are of oval shape, and are supplied in various sizes.

FIG 1

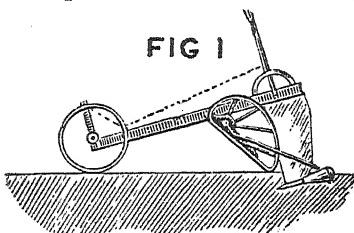


FIG 2

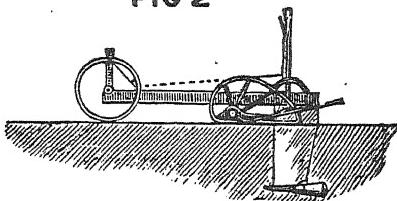
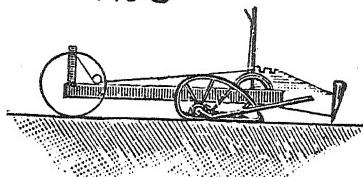
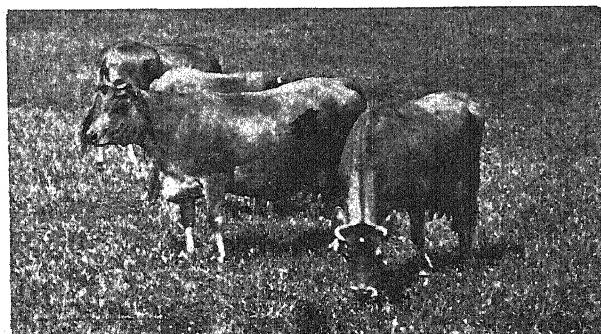


FIG 3



Professor Angus is quite satisfied that this plough will do good work where the subsoil is of a clayey nature, and not too far from the surface. These ploughs are also reported to do good work on soils of a peaty nature, and the drains have been known to last for almost 30 years. The idea is to drain about 2ft. deep, and at intervals of about 30ft.



JERSEY COWS.

MARKETING OF HAY AND CHAFF.

Proposed New Legislation.

It has been found that the Chaff, Hay, and Fruit Act passed last year is unworkable in several of its provisions, and a new Bill is now before Parliament which corrects the errors of last year's Act, and has some new features which are of the greatest importance to users of chaff and hay. The new Bill has been drawn on a more elaborate scale than was the case last year with the object of making it more effective, especially with respect to the few who deliberately endeavor to defy the law. The principal definitions are as follows :—

“Hay” means the stalks, leaves, and heads of any one or more cereals and plants, from which the natural production of grain or seed has not been removed, whether by natural means or by stripping or threshing or other process :

“Straw” means the stalks, leaves, and heads of any one or more cereals and plants, from which the natural production of grain or seed has been removed, whether by natural means or by stripping or threshing or other process :

“Hay chaff” means chaff consisting only of chaffed hay :

“Straw chaff” means chaffed straw :

“Mixed chaff” means hay chaff and straw chaff mixed in any proportions :

“Chaffcutter” means a person who carries on the business of cutting chaff for sale, whether the sale is to be by himself or another person.

SALE OF MIXED CHAFF.

As was the case last year the sale of mixed chaff is prohibited, and no person is allowed to sell any chaff other than hay chaff unless the bag containing it has the words “Straw Chaff” printed on it in conspicuous letters.

THE SIZE OF CHAFF BAGS.

The standard weight of a bag of chaff, whether hay chaff or straw chaff, is 56lbs. excluding the weight of the bag. Last year the weight of a bag of chaff was fixed at 40lbs., the object then being that the Chapman wheat sack might be used as a chaff bag. It has been found, however, that the Chapman sack, as a rule, will not contain 40lbs. of chaff, and in this respect last year's Act has not come into operation. Mr. W. L. Summers, the inspector under

the Hay and Chaff Act, has reported to the Minister of Agriculture on the question as follows :—

With the introduction of the Chapman sack we have a bag that will not hold, except under rare conditions, 40lbs. of chaff. The consequence has been that it was necessary for the cutter to adopt some other bag, and the bran bag is now in general use. I think I am correct in saying that 80 per cent. of the chaff sold around Adelaide and the north is sold in the bran bag, in weights in excess of 40lbs. The result is that we are practically in the position in regard to weights that we were before the Act was adopted. The greater bulk of the trade around Adelaide now is done in 56lbs. bags, but a number of chaffcutters are also putting up 50lb. bags. As the weights are in excess of the standard bag, there is nothing to show whether the bag is supposed to contain 50lbs. or 56lb., and the consequence is that the inspectors finding bags weighing 52lbs. are simply told that these are 50lb. bags, or that the bags are sold by actual weight. At the same time, however, I have had a number of complaints that bags supposed to hold 56lbs. of chaff have, on being weighed by the purchaser on reaching home, contained only 53lbs. or 54lbs.

No person is allowed to sell less than a bag of chaff unless the actual weight of the chaff is printed or affixed to the bag. A ton of chaff is calculated at 2,240lbs., exclusive of the weight of the bags.

ADULTERATION OF CHAFF.

The division of the Bill relating to the adulteration of chaff is as follows :—

11. (1) The Governor may, by Proclamation published in the *Government Gazette*, fix standards for the amount or proportion of moisture and the amounts or proportions of any other ingredients or constituents which may, or shall, be contained in or added to chaff.

(2) Such standards may prescribe a maximum and a minimum, or a maximum or a minimum only.

(3) Different amounts or proportions may be fixed for different periods of the year, and for different parts of the State.

(4) The Governor may from time to time alter the standards so fixed and fix other standards in lieu thereof.

12. When standards have been fixed as mentioned in section 11, no person shall sell any chaff which is not in accordance with the standards so fixed in respect of such chaff which are for the time being in force.

13. No person shall sell any chaff containing, or to which has been added, any foreign ingredient unless such ingredient is permitted by a standard fixed under section 11 in respect of such chaff and for the time being in force.

14. No person whose business or occupation, or part of whose business or occupation, or one of whose businesses or occupations is to cut chaff for sale (whether sale by himself or another person) or to sell chaff, shall have in his possession, custody, or control any chaff containing, or to which has been added, any foreign ingredient, unless such ingredient is permitted by a standard fixed under section 11 in respect of such chaff and for the time being in force, or, when standards have been fixed under the said section, which chaff is not in accordance with the standards so fixed in respect of such chaff which are for the time being in force.

Mr. Summers's report in respect to the moisture in chaff was as follows :—

In our climate damping the hay in the dry weather is absolutely necessary for the comfort of the workers, and to enable good samples of chaff to be cut. Water is a foreign ingredient under the Act, and while we may permit the addition of 5 per cent. of moisture we have no means of checking this, for the reason that the chaff naturally varies in percentage of moisture, and an analysis only shows the total percentage of moisture, and cannot distinguish between added and natural moisture. Further, hay that is naturally damp does not require so much damping as dry hay. If power, however, to fix the percentage of moisture is obtained, we could fix a certain amount as the maximum allowed in chaff. I have had samples contain at least 15 per cent. of added moisture, but we could not prove that this was added. Further, I have found haystacks at cutters' places deliberately exposed to the rain, and hay being cut absolutely reeking wet and mouldy.

REGISTRATION OF CHAFF MILLS.

Another division of the Bill relates to the registration of chaff mills. It is proposed to have a register, firstly of hay-chaff mills, and secondly of straw-chaff mills, and a record will be kept of the names and places of business of chaffcutters. Any person desiring to be registered as a chaffcutter may be so registered on application, and on payment of a registration fee of 10s. There is also provision for a transfer from one part of the register to another, that is from hay-chaff mills to straw-chaff mills, or *vice versa*. No person, however, can be registered on both parts of the register at the same time, that is to say, a man cannot be registered both as a hay-chaff cutter and straw-chaff cutter. It is further provided in clause 26 that no person registered as a hay-chaff cutter shall cut any straw chaff for sale or otherwise or have any straw chaff in his possession or custody or under his control. In like manner no person who is registered as a straw-cutter shall cut any hay chaff for sale or otherwise or have any hay chaff in his possession or custody or under his control. Clause 25 which restricts the business of dealing in chaff to the persons registered reads as follows :—

No person shall carry on the business, whether as his only business, trade, or occupation, or not, or whether in conjunction with any other business, trade, or occupation, or not—

- (a) Of cutting hay chaff for sale (whether sale by himself or another person), unless he is registered under Part I. of the Register:
- (b) Of cutting straw chaff for sale (whether sale by himself or another person), unless he is registered under Part II. of the Register.

SALE OF HAY.

Clause 28, which deals with the sale of hay, is as follows :—

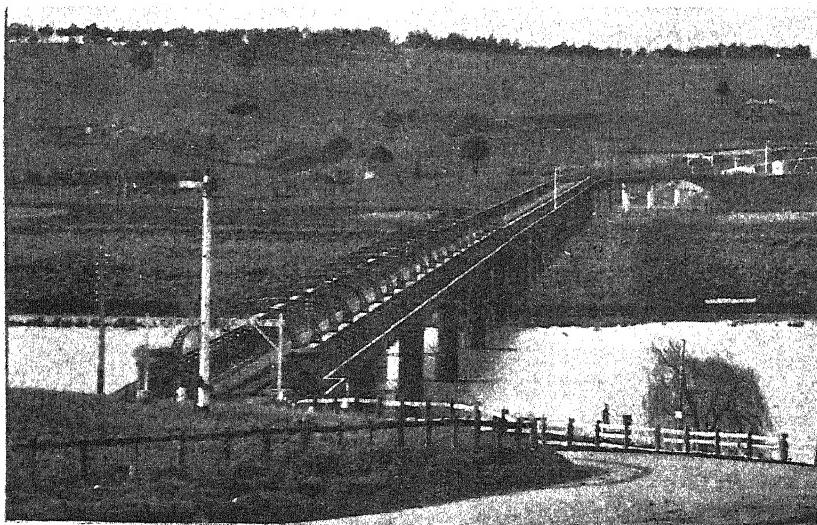
In any contract for the sale of hay by weight there shall be an implied condition that the vendor shall be entitled at his own cost to have the hay weighed on a licensed weighbridge, and that the purchaser shall accept such weight as correct.

WOODS AND FORESTS DEPARTMENT.

The Government have realised the advisableness of extending the operations of the Woods and Forests Department, and this year the proposed expenditure of the department has been increased from £10,080 to £17,575, an increase of £7,495. It is the intention of the Conservator of Forests to extend pine and gum planting wherever possible. A testimony showing the importance of the work of the department and also the fame of Australian timber for railway and other purposes recently came to hand from America where also, apparently, there is a shortage of timber for railway purposes. Captain E. V. E. Neill, an Australian, now resident in San Francisco, has forwarded the following letter to the Commonwealth Government:—"In my present position of accountant and purchasing agent for the E. M. Chadbourne Company, one of the biggest construction firms on the West Coast, I am brought continually into touch with many of the big contractors. From one of these I received many inquiries in regard to our timbers, and after listening to my remarks in regard to them he stated that he was in a position to place an order for at least 1,000,000 sleepers if I knew how to get the right people in line to supply redgum timbers. I am certain that if this matter were carefully handled the Southern Pacific and other of the large railroad companies would take all the timber we can supply. This is only one line in which I feel certain we can do an enormous export trade. A week or so ago I was consulted by a big timber man who was in possession of a sample of our blackwood. He stated he had submitted the wood to all kinds of tests, and was satisfied that it was the best kind of wood he had ever seen for the interior finish of Pullman cars, &c."

Letters were enclosed from Mr. R. B. Swayne, a prominent timber merchant, who invited offers from contractors for the supply of from 50,000 to 100,000 Australian sleepers every three months or six months for the next three or four years. In commenting on the letters, Mr. Gill, Conservator of Forests, said that the supply of redgum for sleepers was rapidly being cut out in South Australia, and all that could be obtained was needed for supplying the railways of this State. It was, therefore, in the highest degree improbable that a million sleepers could be cut of a kind to supply the demands indicated in Mr. Swayne's letter. It would be good policy, however, to let it be known through the press that such a request had been received from a country which for so long had been regarded as possessing an unlimited supply of timber of all kinds. The request emphasised in a pointed manner the urgent need for prompt action in extending forestry operations in Australia.

In his annual report for 1908-9, the Chairman of the Advisory Board writes :—“ The Board feels strongly that more encouragement should be given to the planting and conservation of timber. The high prices ruling for timber of all descriptions (especially sleepers for railways, fencing posts, and firewood) emphasise the necessity for this. Not only should the natural timber be protected and put to better use, but tree-planting on an extensive scale is fully warranted. Private owners planting timber can scarcely expect much return within 20 years under the most favorable circumstances, and naturally there is not much inducement to plant. The Board believes it would be good policy for the Government to offer, under suitable conditions, a bonus to encourage tree-planting. Such bonus should at least be sufficient to cover the cost of the necessary attention to the trees during the first four or five years of their existence ; after that age they would practically entail no expenditure in this direction. In addition to this the Board is of opinion that the operations of the Forest Department should be materially extended, as all timber planted on forest reserves should in years to come prove a valuable asset to the State.”



MURRAY BRIDGE.

THE STANDARD FRUIT CASE.

The Chaff, Hay, and Fruit Bill now before Parliament has the following provisions which it is proposed to substitute for the Act of 1908, dealing with the standard fruit cases :—

29. The standard double case, standard case, standard half-case, standard flat case, and standard flat half-case for fruit shall be of the respective measurements and capacities set out in the Fourth Schedule : Provided that, if a case is of the shape required by the measurements which are applicable, it shall be deemed to comply with the requirements of the said Schedule if the excess or deficiency (if any) in the cubic capacity of such case does not exceed in the whole two and one-half per centum of the required cubic capacity.

30. No person shall, after the passing of this Act, sell or buy any fruit (other than dried, preserved, tinned, or canned fruit) unless such fruit is at the time contained in one or more standard double cases, standard cases, standard half-cases, standard flat cases, or standard flat half-cases, in accordance with the provisions of section 29 and the Fourth Schedule : Provided that this section shall not apply to—

- (a) Fruit sold or bought by weight, measure of capacity, or number, in a quantity at one time of less than twenty pounds in weight :
- (b) Fruit sold or bought, in a quantity at one time of more than two imperial bushels, to or by the owners of jam or sauce factories, or dried, preserved, tinned, or canned fruit factories, for the manufacture or preparation of jam or sauce, or dried, preserved, tinned, or canned fruit, or other similar articles :
- (c) Fruit sold or bought in baskets or punnets :
- (d) Fruit sold or bought in trays each containing only one layer :
- (e) Any particular fruit which the Governor, by Proclamation published in the *Government Gazette*, exempts from the provisions of this Act :
- (f) Any particular fruit sold or bought in cases of such measurements and capacity, or other description, as the Governor, by Proclamation published in the *Government Gazette*, exempts from the provisions of this Act as regards such particular fruit.

31. (1) No person shall sell any fruit in a case unless such case has been legibly and durably impressed, printed, or marked in a conspicuous position, at one or both ends on the outside of such case—

- (a) With the name and address of the maker of the case ; and,
- (b) With the words "Guaranteed by maker to contain two imperial bushels," or "Guaranteed by maker to contain one imperial bushel," or "Guaranteed by maker to contain one-half imperial bushel," according to the size of the case.

(2) Such name and address and guarantee shall be impressed, printed, or marked as aforesaid within a space measuring not more than three inches in length nor more than one and a half inches in width.

32. (1) No person shall place, cause, or suffer to be placed on a case any guarantee mentioned in section 31 which is incorrect.

(2) No person shall alter the size, shape, or any of the measurements of, or in any way tamper with, any case bearing a maker's name and address and any guarantee mentioned in section 31, or wilfully deface or alter or in any way tamper with such name or address or guarantee.

33. The Governor may, by Proclamation published in the *Government Gazette*, prohibit the introduction into any portion of the State specified in such Proclamation of any box, case, bag, or other receptacle which has already contained fruit.

The size of the standard case is defined in one of the schedules as follows :—

Standard Double Case.

1. The standard double case shall be twenty-six inches in length inside, twelve inches in width inside, and fourteen inches and a quarter of an inch in depth inside, and shall have a cubic capacity of four thousand four hundred and forty-six inches.

Standard Case.

2. The standard case shall be eighteen inches in length inside, eight inches and seven-eighths of an inch in width inside, and fourteen inches in depth inside, and shall have a cubic capacity of two thousand two hundred and thirty-six inches.

Standard Half-case.

3. The standard half-case, save that the depth thereof inside shall be seven inches, shall be of the same measurements as the standard case, and shall have a cubic capacity of one thousand one hundred and eighteen inches.

Standard Flat Case.

4. The standard flat case shall be twenty-six inches in length inside, six inches in width inside, and fourteen inches and a quarter of an inch in depth inside, and shall have a cubic capacity of two thousand two hundred and twenty-three inches.

Standard Flat Half-case.

5. The standard flat half-case, save that the depth inside shall be seven inches and one eighth of an inch, shall be of the same measurements as the standard flat case, and shall have a cubic capacity of one thousand one hundred and twelve inches.

The measurements and capacity specified above are, in each case, to be in addition to the space occupied by any partitions in the case.



IRISH BLIGHT.

The Minister of Agriculture has received a report from the Horticultural Instructor with respect to Irish Blight in the potato crops of South Australia. Mr. Quinn, who contributed an article on potato blight to the September issue of the *Journal*, adds the following information :—“ The whole of the plains of Adelaide as far north as Salisbury, the western slopes of the Mount Lofty Ranges overlooking Adelaide, the upper southern portion of the Mount Lofty Ranges proper, part of the northern end, much of the Barossa, Clare, and Wirrabara districts, and the vicinity of Mount Gambier, Glencoe, Millicent, Tantanoola, Rendelsham, and Penola have been visited by the officers, and any suspected plants or tubers from plots, or stores forwarded to me for microscopic examination. Up to the present I have been able to identify the presence of the fungus on specimens from practically all over the plains of Adelaide and at Salisbury, as well as all along the slopes and in the western gullies of the Mount Lofty Range. In the Mount Lofty Ranges the disease has been located upon Norton’s Summit right along to Clarendon and out south as far as McLaren Vale. The eastern and northern ends of this range have not yet been inspected. In the Barossa, Stanley, and Wirrabara districts scarcely any potatoes are grown, and certainly not in the winter season, owing to the extremely low temperatures usually experienced. No signs of the disease have thus far been located in those districts. In the South-East only one small area in the isolated kitchen garden attached to the Moorak homestead, near Mount Gambier, yielded unmistakable evidence of the fungus. This plot has since, with the consent of the patriotically-minded owner, been carefully dug out, roots, tubers, and branches, the whole of which have been destroyed by fire. I am hopeful, therefore, that as the growers in that district do not usually import seed potatoes from other places the disease may have been eliminated. I may say I personally examined scores of small plots of winter potatoes growing in house-gardens in the neighborhood of Mount Gambier, and dissected microscopic portions of any suspicious spots on leaves, but found no further evidence of the Irish Blight. When the crops now merging from the soil are well above the ground, as well as in the autumn of next year, before the tops wither away, a minute inspection should be again undertaken in this important potato-growing neighborhood.”

“ At present on the Adelaide plains and western slopes of the Mount Lofty Ranges there are, or have been, about 200 acres of infected crop made up of areas ranging from 10 acres to a few rods of land. In the ranges proper,

so far as inspected, the infected area is probably not quite as large ; but I suspect many more acres will be added when the inspection is completed. I do not anticipate any outbreaks in the districts north of Adelaide beyond Salisbury. The general absence of inter-State or foreign seed potatoes from the South-Eastern districts and the occurrence of the Irish Blight only in a garden containing non-commercial varieties, some of which had been brought from abroad within a couple of years, may be only a coincidence, but it is one closely bordering upon admissible evidence respecting the origin of the disease.

"The seed potatoes from which the infected crops on the plains of Adelaide were grown were nearly all of the variety known as Bismarck, and can almost without exception be traced to recent importations from Tasmania. Those in the southern Mount Lofty Range found infected were received from Tasmania or Victoria.

"Quarantine.—Until such time as legislative authority is secured quarantine is only a question of open discussion ; hence I respectfully ask the Minister to postpone it until the inspection of all districts is completed and some traversed a second time."

SALE OF INSECTICIDES.

Protection of Fruitgrowers.

For the better protection of fruitgrowers the Government have introduced legislation providing that persons buying insecticides may know the constituents or ingredients of what they are buying in the same way that buyers of fertilisers are protected by the Fertilisers Act of 1900. The principal sections of the Bill are as follows :—

34. (1) When any person sells any insecticide he shall sign and give to the purchaser an invoice, on which shall be stated—

- (a) The figure, word, trade mark, or description which is to be branded or stamped upon or affixed to every package or receptacle containing any of the insecticide sold at that time to the purchaser :
- (b) All the constituents or ingredients of which the insecticide is composed or which are contained therein, and the exact percentage of each of such constituents or ingredients.

(2) Such invoice shall, notwithstanding any agreement to the contrary, have effect as a warranty by the seller of the accuracy of all the matters stated thereon.

35. When any person sells any insecticide he shall brand or stamp upon or durably affix to or cause to be branded or stamped upon or durably affixed to, every package or receptacle containing any of the insecticide sold at that time, a figure, word, trade mark, or trade description corresponding to the figure, word, trade mark, or trade description stated on the invoice given by the vendor to the purchaser upon the sale of such insecticide.

36. (1) It shall be an offence against this Act if any person who sells any insecticide—

- (a) Fails without reasonable excuse to give, on or before, or as soon as possible after the delivery of such insecticide, or any of it, the invoice required by section 34; or
- (b) Causes or permits any invoice or description with respect to or of such insecticide to be false in any material particular; or
- (c) Fails to brand or stamp upon or durably affix to any package or receptacle containing any of such insecticide the figure, mark, trade mark, or trade description required by section 35, before delivery of such package or receptacle.

(2) In any proceeding for either of the offences described in subdivisions (a) and (b) of subsection (1) of this section, the burden of proof that section 34 or 35, according to the nature of the case, has been complied with, shall lie on the defendant.

37. No person shall be bound to accept delivery on sale of any insecticide unless all the provisions of sections 34 and 35 have been complied with as to such insecticide.

In support of these provisions Mr. Summers reported—

This is a matter of very serious importance, especially to the fruitgrowers. Spraying with arsenical compounds is absolutely necessary to prevent injury by codlin moth, and the success of the whole season's work depends on the strength of the constituents and the poison used. There are four or five brands of arsenical poison now on the market, and these are very largely used by growers. I think I am within the mark when I say that the expenditure on proprietary brands alone this year will exceed £5,000, and in my opinion the growers are justified in asking for the same protection as purchasers of fertilisers. As the supposed constituents of these preparations are well known, no hardship would be caused to any honest manufacturer by compelling him to guarantee the constituents thereof.



A USEFUL FIELD ROLLER.

BRITISH IMPORTS OF GRAIN IN THE CEREAL YEAR 1908-9.

The most important feature of the past cereal year (September 1st, 1908, to August 31st, 1909) has been the high price of wheat, together with the good average prices obtained for barley and oats (*says the Journal of the Board of Agriculture*).

The average price of British wheat, as ascertained under the Corn Returns Act, has stood above 30s. per quarter since the week ending May 23rd, 1907, and during the two weeks ending August 7th and 14th, 1909, it reached 44s. 9d. per quarter. The average for the harvest year 1908-9 is 36s. 6d., which is a higher figure than has been reached in any year since 1883. It differs but slightly, however, from that of 1897-98, which stood at 36s. 2d. per quarter. The average price of imported wheat was 39s. 1d. per quarter, as against 36s. 1½d. in 1907-8 and 30s. 5d. in 1906-7.

The high price of wheat appears to have had but little effect on the imports, which amounted to 21,727,000qrs., as compared with 21,363,000qrs. in 1907-8. The variation in the home harvest almost adjusted the difference between the two years, so that the total supply of home and imported wheat was practically the same both in 1908-9 and in 1907-8, viz.: 28,468,000qrs., as compared with 28,429,000qrs. The quantity of imported wheat meal and flour was, however, less in the year just ended, and only amounted to 10,969,000cwts., as against 13,389,000cwts. If these figures are converted into the weight of grain which the flour may be supposed to represent and added to the above totals, it will be found that the total quantity of wheat available for home consumption, including seed, but exclusive of stocks carried over, was 32,023,000qrs., as compared with 32,768,000qrs. in 1907-8. The figures for the past six years are compared in the following table:—

	Quarters.				
1903-4	34,030,000
1904-5	32,796,000
1905-6	34,283,000
1906-7	33,966,000
1907-8	32,768,000
1908-9	32,023,000

It will be seen that, notwithstanding the increase in the population, the supply during the past year fell below that of any of the preceding five years,

With regard to the countries contributing to the supply the receipts from each of the principal sources are given below :—

Country of Export.	Thousands of hundredweights.			
	1908-09	1907-08	1906-07	1905-06
India	10,904	.. 10,480	.. 14,613	.. 11,743
Russia	9,470	.. 4,455	.. 12,843	.. 18,377
Argentina	24,542	.. 28,128	.. 22,179	.. 22,890
United States	19,299	.. 25,273	.. 20,319	.. 17,917
Canada	15,118	.. 13,578	.. 11,085	.. 11,177
Australia	9,587	.. 6,264	.. 7,769	.. 7,488

The Argentine Republic was the principal exporter to this country, the United States taking second place, and Canada the third. Australia sent a larger amount than had been the case for several years. Roumania, which in some years contributes a few million hundredweights, sent a very small supply, and the only country other than those mentioned in the above table which furnished more than 1,000,000cwt.s. was Chile.

As regards flour, the United States contributed 6,997,000cwt.s., while Canada sent 2,056,000cwt.s. The imports from Austria-Hungary, at one time a considerable exporter, were insignificant.

While the home supply of wheat only represents about 25 per cent. of the total, home-grown barley and oats still furnish the bulk of the supply.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, October 13th, there being present Messrs. A. M. Dawkins (Acting Chairman), C. J. Tuckwell, C. J. Valentine, J. Miller, G. R. Laffer, and Professor Perkins.

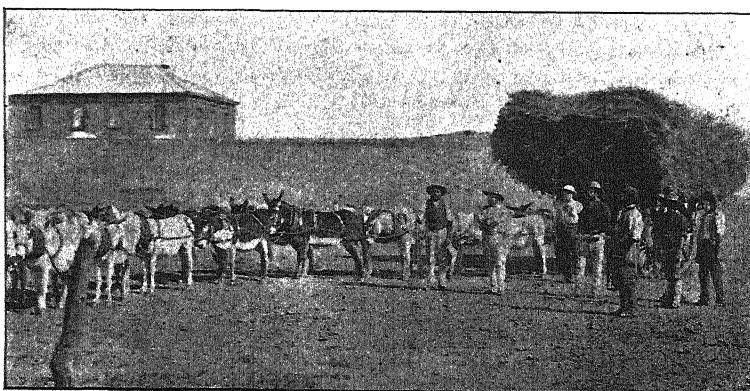
The Secretary read the report of the Judges who acted on the occasion of the trial of stone-gathering machines at Paskeville. On the motion of Mr. Valentine it was decided to recommend the Minister of Agriculture to give effect to the proposals of the Judges in regard to the awards. It was resolved to recommend to the Minister that a further trial of stoneminerers be held in February or March next.

The formation of Branches of the Bureau at the following places was approved, with the undermentioned gentlemen as members :—Kalangadoo—Hon. G. Riddoch, M.L.C., Messrs. A. Gibb, E. F. Crouch, T. H. Morris, E. Earle, G. Ellison, S. Tucker, D. W. Tucker, R. C. Boyce, A. Rake, N. McColl,

W. F. Osborne, A. Vorwerk, T. Hunt, jun., J. A. Sudholz, and J. Boyce ; Wilkawatt—Messrs. H. M. Harvey, G. A. Altus, W. J. Cushion, J. Tunny, J. F. G. Kernich, D. F. Bowman, A. V. Ivett, H. F. Ahrns, P. T. E. Gregurke, H. H. Brooker, J. W. Altus, J. Ivett, T. Sorrell, C. Sorrell, J. E. Altus, E. W. Brooker, W. R. Neville, and W. J. Tylor ; Salisbury—Messrs. W. J. McNicol, R. King, C. Heier, A. Coher, F. Sayers, J. B. Laurie, E. Moss, F. H. Kuhlmann, J. Harvey, and A. G. Jenkins ; Merghiny—Messrs. J. B. Talbot, R. P. Symonds, W. J. Bubner, E. D. Barnett, T. Moody, E. F. Schwartz, J. O. Shorn, L. Cranwell, A. Shilton, H. J. Schwartz, J. H. Wills, and J. W. Basham, Wild Horse Plains—Messrs. H. A. Lyons, C. H. Lyons, H. W. Lyons, C. E. Clark, H. Rundle, H. Baker, E. Baker, A. Parker, K. Hill, C. Primer, A. Daniel, E. Pope, G. Jones, R. Bailey, A. Wood, J. A. Lyons, and H. Hartley. Also one at Frances, subject to suitable names being submitted.

A request from the Paskeville Branch was received asking that the Board should use its influence to get the size of the standard cornsack altered. It was decided to inform the Branch that the Board had already taken action in the matter and could not see its way to do anything further in it at this juncture.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. H. Roberts, Balaklava ; A. E. Bowen and H. Perkins, Lameroo ; R. F. Hughes, Clare ; J. Sinclair, Nantawarra ; R. Burton, O. Waye, and W. T. Waye, Willunga ; J. G. Shackley, A. C. Stevens, C. B. Godely, and E. Leishman, Keith ; H. Parsons, Morchard ; E. Luke, J. Davis, W. Webb, and P. Webb, Koolunga ; G. Wagenknecht, and E. McLarne, Bowhill ; H. Marshall and S. Griffin, Moonta ; L. E. Young, Paskeville ; J. Fleming, Shannon ; E. J. Eagle, Port Pirie ; J. Ritchie, Port Elliot ; G. F. Goodhart, Petina ; J. Gilfillan and J. Botroff, Parrakie ; C. Barnett, Kingston ; G. H. Wall, Coonalpyn ; F. Mitchell, Whyte-Yarcowie.



A TEAM OF DONKEYS IN THE FAR NORTH.

POULTRY NOTES.

By D. F. LAURIE.

TABLE POULTRY.

For prime, well-fattened chickens, of 2lbs. dead weight and over, there has been an excellent market in Adelaide during the last few months. The prices paid by the leading poulters are highly satisfactory and make this branch of the industry very profitable. Breeders, as a rule, have been misled on the subject of size and weight. I have for years pointed out that big weights are neither profitable nor in demand. The longer you keep a chicken the more it costs to feed and the more risks it runs. Up to, say, 10 or 12 weeks old, the cost of rearing is not very much; but from that time onward the cost rapidly increases. If the spare cockerels and cull pullets are at that age (or thereabouts) drafted into the fattening yard for a few weeks they will soon put on flesh and should then be penned in coops and topped off for a fortnight or three weeks. Chickens and ducklings will not fatten if allowed to run about. It is surprising how soon they can be fattened if proper attention be given. The Produce Department is in touch with several buyers, and good prices can always be relied upon for good class poultry. Old hens, &c., can also be disposed of, but, of course, at less prices than rule for prime quality.

TABLE-POULTRY SHOW.

In order to encourage the production of high-class table poultry, and to foster the export trade, it has been decided to hold a table-poultry show at the Government Freezing Works, Ocean Steamers' Wharf, Port Adelaide, during February, 1910. Prizes totalling £20 have been allotted, and a comprehensive schedule suitable for the export trade has been decided upon. Cockerels and pullets have separate classes and may be exhibited in pairs, half-dozens, and dozens. In addition, there are classes for under 4lbs. and for over 4lbs. weight. For White Leghorn breeders, and owners of small chickens generally, there are two classes for small chickens (sometimes called "squabs"). The weights of these will vary from 1½lbs. to 2lbs.

Ducklings have three classes—for pairs, for half-dozens, and for dozens, and must all be over 5lbs. live weight. All ducklings must have white plumage—colored sorts cannot compete. Chickens with black legs are debarred from competing. The Commercial Agent states emphatically that no chickens with black legs should be sent to England. The prejudice

against black legs is as strong as ever. Yellow legs are not, of course, equal to white in the English buyer's opinion ; but the excellence of the American poultry shipped to England has to an extent removed the prejudice which long existed. We must cater for English market requirements and respect prejudices. We all know that a prime, young, well-fattened Black Orpington or Langshan is an excellent table bird, with white skin and flesh of good quality, but the prejudice exists. Tastes differ, and birds that are considered first-class here by many breeders would not find ready sale in England.

All the birds at the show will be exported to England, and for the convenience of breeders an advance of 1s. on chickens and 2s. on ducklings will be made at time of shipment. The balance of the proceeds will be paid on receipt of account sales from London.

LAYING COMPETITIONS.

There will be two laying-competitions next year—one at the Roseworthy Poultry Station and one at the Kybybolite Poultry Station. The latter will be confined to South-Eastern competitors, with probably Murray Bridge as a dividing line. Schedules are now ready and will be forwarded on application. According to all accounts there should be a heavy entry for Roseworthy, and in order to provide accommodation it is necessary for entries to be in early in January. There will probably be 150 pens or more. Last year there were three sections, but the entries were so poor in section II. that it had to be abandoned, and the few pens of Minorcas, Brown Leghorns, &c., are competing in section II. (all other breeds).

This year it will be—I.—White Leghorns, II.—Other light breeds, III.—Heavy breeds. At Kybybolite there will be about 50 pens, and one section only ; all breeds will compete together.

SELLING EGGS BY WEIGHT.

Many references have been made to this question, and I have often been asked to express an opinion thereon. Now that grading is being introduced it would be a less difficult task to make an alteration than before. In Denmark the co-operative societies purchase eggs from members by weight. Here it could be worked on the basis that the standard egg shall weigh 2ozs., or eight to the pound. Thus, eggs at 8d. per dozen would mean standard 2oz. eggs 8d. per pound. Larger eggs would weigh seven or perhaps only six to the pound, while others would go nine or ten to the pound. The actual grading would have to be done at the packing houses. In the meantime, however, there is a lot to be done in inducing people to produce plenty of clean fresh eggs. Times are prosperous just now, and not much care is exercised by some people in collecting the eggs. Many people, whose fowls lay small eggs, think they ought to be paid as much for them as the man

whose birds lay extra large ones. The trouble has been that in the past anything with a shell on it has passed muster, and no encouragement has been given for the production of high quality and good marketable size.

SEASONABLE HINTS.

Make provision for renewing your poultry stock before it is too late. If you have not hatched plenty of good chickens you had better arrange for the purchasing of some, or order some good breeding stock for early delivery next year.

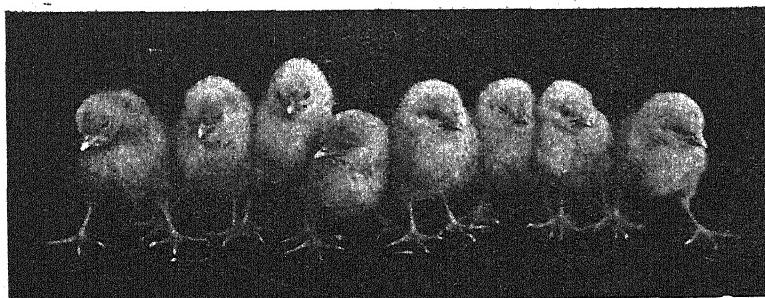
Vast improvement is necessary in the average farm flock. Many farmers prefer crossbreds and mongrels to the reliable, useful purebreds—they say so and you can see it in their fowls, cattle, and horses. In time their successors will know better, and we shall see much better results.

Grow green food wherever possible; if not, use nice wheaten hay chaff steeped in hot water for a few hours and then mix with bran and pollard. This saves cost of feed and gives more eggs.

Keep a good supply of cool, clean drinking water, and see that it is well shaded. Erect sun shelters so that in hot weather the birds may have some protection.

Eradicate the fox and see that the roosting places are securely fenced with wire-netting.

With the approach of warm weather vermin will increase if not checked. The poultry tick must be eradicated. The carelessness of some people over this matter in the past has led to the spread of tick in many localities. Under the provisions of the Stock Act tick must be destroyed—there are penalties for not doing so.



AGRICULTURAL BUREAU CONGRESS.

(Continued from page 249 of the October Issue.)

Wednesday, September 15, 10 a.m.

Mr. J. W. Sandford (Chairman of the Advisory Board of Agriculture) presided.

FREE PARLIAMENT.

Second Flowering of Wheat.

Mr. W. B. Davis (Brinkworth Branch)—“I regret that I was unable to be present to read my paper on Tuesday afternoon. I have been asked to explain what I mean by the second flower of wheat. After the first flower, if you take notice, you will find on the lower part of the heads a new flower which is scarcely seen. It is about the fourth or fifth grain from the bottom of the head. It will appear to you that the flower is a new one. It is very small, and tinted with blue. When that comes off you are quite safe in cutting good, sound, green wheaten hay. I do not care what the wheat is. It is more noticeable on Dart's Imperial than on any other wheat I know. We have been cutting hay for the last 30 or 40 years, at the rate of from 600 tons to 1,000 tons, and that has been our experience.”

Mr. Chalmers—“I have had 30 years' experience, and I can say that the second blossom is of a yellow color. I have seen it hundreds of times.”

Professor Perkins—“I am certain you have been deceived in reference to the so-called second flowering of wheat. Sometimes I have been deceived myself. Possibly you overlook the fact that there is successive flowering. What you take to be the second blossom is the flower opening out. There are from five to eight flowers, and each one will extend in succession and start from the centre of the head, and not from the bottom. They gradually work from the top to the bottom. It is all one bloom. If you call one the second bloom, it becomes a question as to where you are going to begin. I am afraid that the term ‘second bloom’ is incorrect. What is called the bloom is nothing else but the male part of the flower after fertilisation has taken place. If a new head sprang out from below, that would be the second bloom.”

Black Rust.

Mr. T. Smart (Inkerman Branch) introduced a discussion regarding black rust in wheat. He stated—“In our district the most profitable wheat is Gluyas, but it is subject to black rust. On the testimonial of a gentleman

whose word is to be relied upon I gave fungusine pickle a trial. The wheat was graded, and it germinated within eight days, as against from 10 to 12 days in the case of bluestone pickle. That was sown at the latter end of May, and so far no black rust has appeared. What we are anxious to ascertain is the experience of others—whether they have found this solution useful in preventing black rust."

Mr. Giles (Mount Pleasant)—"I have proved in dry country that Gluyas is one of the best yielders, and has never suffered in any way from black rust. It is useless for hay, because it is too hard. If you want to cut for hay you must cut when green. I have always pickled with bluestone. I think it is absolutely a rust-proof wheat. Some seasons it will stool more than others."

Mr. Malcolm (Kadina)—We had a parcel of Gluyas sent to our Branch for trial. The first year it proved very good, and I believe you will find that this season it has been more extensively tried. The initial test was a good one, because black rust was prevalent."

Mr. Searle (Miltalie)—"The cause of black rust is overworking the land in a dry state. That is the conclusion I have come to after many years' experience.

Mr. Carmichael (Port Germein)—"I do not think any wheat takes black rust worse than Gluyas, if you except Bobs. Four or five varieties of wheat were grown in our district side by side for the Advisory Board of Agriculture. They were all pickled with bluestone, and all graded. They were all sown on the 4th of May. The Gluyas was half smothered with black rust, but there was none on Carmichael's Eclipse. Strips of Gluyas were sown between each row, and were not pickled at all, but there was very little difference so far as black rust was concerned."

A Delegate—"Is black rust hereditary? My experience has been that it is more prevalent in the dry countries, irrespective of the working of the land, than in wet centres."

Professor Perkins—"I have grown Gluyas at the College for 10 years, and I consider it to be one of the best wheats you can grow. The only fault I have to find with it is that it is inclined to bend over in harvesting time and cause difficulty in stripping. It is practically rust-proof, and I have seen it in bad years. I am not aware that it is liable to black rust any more than other varieties. I have seen a few places affected here and there in Gluyas, but never to any serious extent. What is called black rust should really be called flag smut. This disease has often puzzled me as to its method of development. We know well how effective bluestone pickle is. My investigation has shown that it is not the grain that is affected with black rust, but the soil. Black rust goes down in the ground, and there the germs of the disease remain. The trouble will occur, however much you pickle the seed. The same applies to the loose smut on wheat. You cannot pickle against

that, because it is in the field long before the grain is ripe. I am under the impression that when you pickle with bluestone the powdering of the wheat with lime would be a protection against what might be in the ground when the wheat germinates. You have to recollect that the plant is affected only at the time of germination. The only time it could be affected is within a few days of germination. If you protect the grain at the moment it germinates I feel certain you will protect it against black rust. Bluestone fungicide and formalin have been recommended. I do not think formalin would adhere any more than bluestone. I suggest that lime is the probable remedy. In certain climates the soil seems to favor black rust."

Mr. Summers—"Some of the delegates have no doubt heard a good deal about supposed smut-resistant wheats that are going to be introduced. All sorts of wonderful results have been claimed for them. In a recent report by Mr. McAlpine he stated that he found that the so-called smut-resistant wheats were of varieties which germinated very quickly indeed. I think that bears out what Professor Perkins says: that the affection takes place just at the moment of germination."

Mr. Davis (Brinkworth)—"I once put in 80 acres dry. I put in 1,000 acres after rain, and used the same wheat and the same pickle, and there was scarcely a bit of black rust in the lot."

A Delegate—"I have come to the conclusion that the time of sowing has everything to do with it. If you sow wheat and let plenty of rain come on it I do not think there is any fear of smut. We sow our wheat to-day, and to-morrow we may get a few points. The consequence is some of it half starts, and it is then that the smut takes effect. If you do not get enough rain to start the wheat properly all the pickle in the world will not keep rust away."

Sale of Insecticides and Fungicides.

Mr. Warren (Lyndoch)—"In order to bring the subject clearly before the Congress, I move—'That in the opinion of this Conference it is desirable, in the interests of the fruit-growing industry of the State, that the Government shall pass legislation compelling manufacturers of insecticides and fungicides for orchard uses to maintain standards of quality in the same, and that the covering of each parcel or vessel containing the insecticide or fungicide, together with the invoice supplied to the purchaser, shall guarantee the contents of such parcel of insecticides or fungicides and the condition of the same.' The Lyndoch Branch wrote to the Advisory Board of Agriculture about the matter. The Board replied that it was a question for the fruit-growers to take up. I was under the impression that the Advisory Board was so composed that it represented all interests, including fruitgrowers. The Government has compelled us to spray, and therefore it is right that the officials should see that we are safeguarded in connection with the use of sprays with the probability of some beneficial result. I know two men who

secured two tins of insecticide. One took one tin and the other the other. They used a spray pump between them. One orchard returned 90 per cent. of clean fruit—I may say they were spraying for codlin moth—and the other man did not get more than 40 per cent. of clean fruit. He might as well have sprayed his trees with water. The man who got the dirty fruit borrowed some spray from his neighbor, and used it. The fruit sprayed with it was clean, while the fruit treated with his own tin again was even more dirty."

Mr. Smith (Angaston)—"I second the motion on behalf of our Branch. I think in this matter we have a right to expect the farmers to help us, although it does not directly touch them. We should have the support of the whole of the fruitgrowers in South Australia. At present experiments with a highly-recommended local article are being carried out, and it is a great risk where a man has hundreds of trees. It is time fruitgrowers had some guarantee of the reliability of the solution. No agent should be allowed to go round the country, as agents are doing, selling stuff and using the names of growers on its behalf without permission."

Mr. H. Emmett (Lyndoch)—The Advisory Board has advised that orchard inspectors should have increased powers. It might have gone farther and advised the Government to see that solutions sold to fruitgrowers are of guaranteed strength. In our district spraying has been a complete failure. In some cases we may just as well have sprayed with pure water. Last year I sprayed with arsenate of lead. I got a supply from Adelaide, and gave it a complete trial. The result was that I have obtained about 50 per cent. of clean fruit. One week I got 3,600 codlin moths from my trees. The trees are attended to every year, and properly bandaged. During the season I destroyed more than 20,000 codlin moths. If I had not attended to my trees and had relied on spraying I would not have got more than 25 per cent. of fruit.

Mr. P. T. Curnow (Wirrabara)—"I support the proposition. There should undoubtedly be some guarantee, and we in our district have had practical experience of the harm of using various spraying mixtures. We got a supply of arsenate of lead from Adelaide, and sprayed as carefully as any man could, but with very little success. We came to the conclusion that the material supplied to us was of bad quality. The arsenate was a bluish color."

Mr. Summers—"Mr. Warren has unconsciously done the Advisory Board an injustice. The Board was asked to take up the matter of the sale of arsenate of lead. There were two fruitgrowers at that meeting, and they supported the opinion previously expressed by the Fruitgrowers' Association, and that was that growers could easily protect themselves in combining and purchasing under a guarantee. I found I could not get the growers to combine. I heartily support the motion. Practically the whole of the apple and pear crop is depending upon the purity of these arsenicals. One certain brand of arsenate of lead has been successful. In connection with advertise-

ments which appear, the Fruitgrowers' Association properly argue that these people should be asked to come up to the statements they make. I think it is only a fair thing. It was in America that the arsenate of lead originated. The authorities have given careful consideration to the question of a guarantee, and they have asked that there should be a standard. The following paragraph appeared in the *Fruit World* :—

It may be of interest to know that an active campaign has been conducted in the United States for the past two years for a National Pure Insecticide and Fungicide Act, along the lines of the Pure Food and Drug Act. This Bill was drawn and fathered by the Association of Economic Entomologists, assisted by the Official Association of Agricultural Chemists. The more representative manufacturers of the various insecticides and fungicides have given this agitation their strongest support, although naturally there has been considerable opposition from some quarters. A section from the Bill with regard to arsenate of lead is quoted herewith.

"Section 7.—That for the purpose of the Act an article shall be deemed to be adulterated—in the case of arsenate of lead :

- " 1. If it contains more than 50 per cent. of water ;
- " 2. If it contains total arsenic equivalent to less than $12\frac{1}{2}$ per cent. of arsenic oxide (As_2O_3) ;
- " 3. If it contains arsenic in water-soluble forms equivalent to more than 0.75 per cent. or arsenic oxide (As_2O_3) ;
- " 4. If any substances have been mixed and packed with it as to reduce, lower, or injuriously affect its quality or strength, provided, however, that extra water can be added to lead arsenate (as described in this paragraph), if the resulting mixture is labelled 'Lead Arsenate and Water,' the percentage of extra water being plainly and correctly stated on the label."

I may say that some of the advertisements to which I have referred are as follow :—'Arsenate of lead.—Nicholl's—This contains more arsenic than any other paste.' 'Blue Bell—Is absolutely insoluble in water, and cannot burn the foliage.' 'Austral—Guarantee all that imported arsenate will do, and that it will not scorch or burn the trees in any way. We are prepared to guarantee to make good any loss to growers arising from using Austral brand.' 'Platypus—Is as good as the best—quite equal to and cheaper than any that is imported.' 'Federal—Guaranteed pure arsenate : will not burn.' Mr. Summers gave some figures about the different brands of arsenate of lead. He considered that as fruitgrowers they had very good reason to ask that this stuff should be sold under guarantee.

Meeting-place for Bureau Members while in Adelaide.

Mr. Engelbrecht (Mount Gambier)—"The matter I wish to introduce is the question of having some meeting-place for Congress delegates while they are in Adelaide. After our Conference here we virtually disappear. This should not be so, because we have many matters in common which could with advantage be thrashed out. I think it would be a splendid idea to have some meeting-place where we could gather in a more social manner than is possible at this Congress. I would suggest that the Advisory Board should arrange some sort of meeting-place where members could get together and chat, write letters, and have refreshments, and so on. The rooms would

be for the use of farmers during the Show season. One member might say he wanted some knowledge about poultry-raising. He would be put under the poultry section. Another might wish to have particulars about dry farming, and he would be grouped with the farmers on a similar mission. And so the various groups could be formed. By some such social arrangement our ladies could meet as well. I do not see why we could not have a dinner the same as other organisations have. I have no definite idea of a scheme, but the general principle commended itself to me as I hope it will to you."

Mr. Malcolm (Kadina)—"I am afraid that owing to the number of meetings which occur at Show time for farmers that this would not be a success."

Mr. Sassanowsky (Mount Gambier)—I support the idea of Mr. Engelbrecht. The information to be obtained at such a meeting-place would be instructive, and the proposal would tend to happier relations between members."

Mr. Summers—"I think the idea is a good one, and I cannot see the force of Mr. Malcolm's objection. Other bodies in the past have not considered us, and there is no reason why we should consider them now. Mr. Engelbrecht's idea is to have some place where members could informally discuss matters of mutual interest. If it could be carried out in a simple way it would be most beneficial."

Mr. Engelbrecht—"I move—'That it be a recommendation to the Advisory Board that such accommodation should be engaged for the benefit of delegates to the Conference during Show week.'"

Mr. Hughes (Woodside)—"How should the expense be met?"

Mr. Engelbrecht—"You will be expected to pay for refreshments. Accommodation would be provided by the Government."

Mr. Castine—"I second the motion. It would be splendid to have some recognised place for a spell and a smoke. Delegates would not mind paying for it."

The Chairman—"I cannot help noting the presence of young men at this Congress. I suggest to Mr. Engelbrecht that his idea may perhaps help to win greater attention in the younger farmers on matters relating to agriculture. Some such central meeting-place as he has suggested might be a very happy centre for them, and might create the very atmosphere which is wanted."

The motion was carried.

Railway Charges for Carriage of Pure-bred Stock.

The Amyton Branch introduced a brief discussion on this subject. The delegate selected to initiate the debate said, "If you want to truck a stallion from Adelaide to Orroroo it would cost £4 13s. on the railway. If you send three stallions it would cost £13. Although the same compartment may be

used there is no reduction. I consider it is an injustice to farmers. We have to take the whole responsibility of the safe carriage. I move that the Government be requested to grant reasonable charges."

Mr. Brewster (Quorn)—"I second the motion."

A Delegate—"I wish to mention that racehorses are carried at half the ordinary fee. That is encouraging racing and discouraging the farming industry.

Mr. McCormack (Bute)—"If you wish to receive accommodation in the horse-box you must pay for it. The stock are returned free of charge. If a stallion is sent to some place and is not sold it is brought back without any further charge."

Mr. Warren (Lyndoch)—"If you take risks with stud stock at ordinary rates you can do so. There are cattle trucks and horse boxes. You can have the preference. If you want a special box for a stallion you have to pay for it, and quite right too."

Mr. Malcolm (Kadina)—"Why should horses when they are going to races go in the same class of box for half the price? It is a decidedly wrong principle."

The Chairman—"The Board will place the matter before the Minister."

Failure of Wheat to Germinate.

This subject was initiated by the Geranium Branch. The delegate responsible for its introduction said, "We have found the grain turn black or mouldy. If you squeeze the grain, water will come out. What is the reason?"

A Delegate—"Wet weather."

The Geranium Delegate—"We do not know whether or not it is extra-heavy pickling."

Professor Perkins—"It might be both."

Mr. Summers—"How do you pickle?"

The Delegate—"Half a pound to 4bush."

Mr. Brewster (Quorn)—"I have had some experience. The wheat seems to drown. It may be due to flooding after sowing. The ground becomes water-logged."

Co-operative Shearing by Contract.

Mr. McCormack (Bute)—"We have introduced this matter with the idea of securing information. We want to know if members have had practical experience. We hope to introduce it next year in our district."

Mr. Sasanowsky (Mount Gambier)—"Mount Gambier is rather a wet district. We may have to stop shearing one day a week. In the whole district you may have from 100 to 150 men shearing during the season. Our

policy is, of course, to get wool off as quickly as possible in the fine weather. By a co-operative system we may have only 10 men working on fine days. Co-operative system may mean a better style in the get-up of the wool."

King Island Melilot.

Mr. Summers—"I wish to show the Congress a sample of the famous King Island Melilot. A gentleman in the North says it is a useless weed, and that nothing will touch it. I told him that the stock had not been educated up to eating it. It grows vigorously on the railway lines around Adelaide. In Adelaide and suburbs men pay the Railway Department for the right to go and cut it. Some do it without payment. It is called Californian lucerne, and grows right through the South-East."

Mr. Brewster (Quorn)—"Stock will not touch hay with that weed in it."

Mr. Summers—"The weed is in flower now. In six or eight weeks time, with a little warmer weather, it will go quite dry."

Mr. Castine—"The weed is cultivated largely on Kangaroo Island. Cattle pick it out from the loose hay. It is one of the best feeds we have. It grows well near the coast."

Wednesday, September 15, 7:30 p.m.

Mr. J. W. Sandford again presided.

Manuring of Fruit Trees.

Mr. P. J. Curnow (Wirrabara Branch) contributed a paper on this subject.

"In attempting to deal with the above question it is mainly with the intention of creating a discussion on a matter of great importance, and of giving my own experience during the past four seasons.

"We frequently hear the remark made, 'That he who causes two blades of grass to grow where only one formerly flourished is a public benefactor.' If such an one is a benefactor, then how much more so is he who can teach our horticulturists how to produce two cases of fruit to the tree where only one is at present obtained? Surely such a consummation is worthy of every attention at the hands of our growers; and that it is possible to so increase the yield the writer will endeavor to prove.

"Experienced fruitgrowers are aware that every variety of fruit tree after reaching maturity will produce first-class fruit for quite a number of years without any artificial stimulation other than the careful cultivation of the soil. When trees reach up to 12 and 15 years of age, there appear the first signs of soil exhaustion. During the vigorous growth of the young tree

the amount of natural humus in the soil helps very materially to keep the soil friable and open, preventing the caking of the latter in dry weather, and also provides plant food for a number of years when worked into the land by good tillage.

"As the trees get older this humus gradually disappears, and we then find that very little moisture will bake the earth and make it crack badly if not hoed and attended to at once. When this stage is reached a very noticeable change gradually comes over the trees. Where large fruits were formerly produced now a larger crop of fruit of a much diminished size is the result. The tree roots have by this time practically exhausted the whole of the soil between the other surrounding trees, and unless measures are taken to help renourish this area, the fruit will continue to deteriorate, and the tree to lose vitality.

"The question then is, 'What can the grower do to remedy matters?' He is aware that at the present time, where competition is so keen locally, and where the export trade demands the very finest fruit, it is unprofitable to produce anything other than first class in character.

"Of course the scientist will say, 'Have your soil analysed; find out which soil constituents are lacking!' This would be the wiser plan if the average grower's land were quite uniform in character, but when we recollect that the ordinary orchard will contain very many sorts of soil, then soil analysis would be too expensive for most growers. Agricultural and horticultural writers in this country for very many years past have claimed that the absence of phosphates and potash in our soils is the characteristic of very large areas, and in support of this contention point to the splendid yields of wheat now obtained by the use of phosphatic manure from land that had become exhausted by frequent cropping; also to the larger yield by the use of this manure on even new land that had not been previously planted to cereals.

"If the fruitgrower wishes to ascertain what manure will revitalise his soil, the better plan is for him to experiment on his own account. Let him use a given quantity of one manure, say bone super. on one block; on another the same manure with ammonia added; on still a third, bone super. and sulphate of potash. In this way he can study local conditions and adapt any given methods or quantities to suit his own circumstances.

"Previous to four seasons ago the artificial manuring of fruit trees in this Wirrabara district had not been attempted. Although the oldest trees here are quite 30 years old, the great majority are only from 12 to 18 years of age, while of recent planting (since the development of the fruit export trade) most are not yet in bearing. The original plantings were small, and only since the subdivision of the forest in 1891, and the planting of large areas in the Wongyarra district about the same time, has fruit-growing made that advance which has since made a name for the district as a producer

of first-class fruit. For many years (even during the long drought) a good sample was obtained while the trees were young, or comparatively so.

"As the years go on there has been noticed the deterioration referred to earlier, and some four seasons ago the members of the Wirrabara branch of the S.A. Fruitgrowers' Association decided to take up the question of artificial manuring of fruit trees. As Hon. Secretary of that body the writer formulated a number of questions and submitted them to the *Fruit World* newspaper. These questions were in turn submitted to Mr. Leo Buring, a one-time South Australian, who went to some trouble in replying. Mr. Buring made a number of recommendations in reference to the manures to be used and the methods of application. The use of potash was specially recommended.

"Since that time growers here have been working on the lines laid down by the above gentleman with the most gratifying results. The writer's trees are principally about 16 years old. Many are growing on inferior limestone land and mostly consist of apple trees. These do well in limestone until about the time the bearing age is reached, when they soon show signs of 'die-back.' For a number of years fine fruit was obtained, but as soon as the soil became exhausted the fruit deteriorated as usual. As soon as the use of manure became necessary the writer purchased for experimental purposes half a ton of bone super. and 2cwt.s. of sulphate of potash. Although the bags containing the potash were branded as such, the manure was more like sulphate of ammonia—it was certainly not sulphate of potash. These two manures were used in this proportion—5lbs. of bone super. and 1lb. of potash to each tree. The manure was applied in July. The following season the trees made vigorous growth; some that had only grown a few inches the previous year made up to 2ft. of growth, and one old stunted Jonathan, growing on a limestone soil, made limbs up to 3ft. long, but curiously there was no increase of crop. The next year 1 ton of bone super. and 4cwt.s. of sulphate of potash were used. Splendid results followed; not only was the crop very much larger, but the individual fruits increased wonderfully in size. Last year more manure was used, with quite unexpected results. Two varieties of apples—Dumelow's Seedling and Lord Wolseley—although 16 years old, had never borne a decent crop. Lord Wolseley had produced up to three cases to the tree previous to the application of the fertilisers, but last season gave a return of six, seven, and eight cases to the tree and very large fine fruit, in spite of the fact that no rain of any use fell from October 10th to March. Dumelow's Seedling also did well. The writer had concluded that these two sorts were unsuited to the locality, but would now suggest that the absence of some soil constituent was the real difficulty.

"A number of old peach trees were treated in the same way, and with the same manure. The first season the trees produced a medium crop, and the fruit was quite as large as that generally gathered from young trees. Last

season, owing to the production of a very heavy crop, that should have been thinned, and the long dry summer, the fruit was poor in quality. In spite of this experience the writer is convinced that the quality of fruit from old peach trees can be vastly improved (if trees are not allowed to over-crop) by the use of suitable fertilisers.

"Zante currants were also treated as an experiment, and the improvement in growth and quality of fruit was quite satisfactory.

"While admitting that the growth made the first year was unusual, it may be pointed out that such growth does not always follow the application of these artificial aids to the soil, although a very noticeable difference can be readily seen if manure is not spread too late. Other growers here and in Wongyarra district have tried manures of various kinds. Mineral super. is generally used in combination with ammonia and sulphate of potash. In every case good results have followed the use of these soil regenerators. Old trees have borne large crops of very fine fruit, thus again placing some growers who own old orchards in the position of the man who has young trees to sustain his reputation as a grower of large clean samples of his art.

"Where we hear so much about 'intense culture' and 'closer settlement,' anything that can be advanced that will tend to bring the necessary area upon which a family can make a suitable living down to even smaller limits than are needed now, should be carefully considered and duly weighed ere a final decision, either rejecting or advocating such measures, be come to. If it be possible for a man to make a living from a 10-acre patch with ordinary methods, then how much more readily should he adopt a plan that needs only five acres that will produce as much? And the writer contends that it is possible to produce as much from the last named area with manure as from the first amount of land without."

Mr. Smith (Angaston)—"The writer knows what he is talking about, and is evidently speaking from practical experience. Soils differ in character very much, even within a limited area, and probably analyses would be necessary. Perhaps it would be well if producers bunched the soils together and took an average sample. I fully expected Mr. Curnow to mention green manures, especially those of the leguminous class. In Angaston we have ploughed in green peas instead of growing manure. It is infinitely cheaper. I ploughed in a crop one year. It was estimated it would go 60bush. to the acre. This year a crop of wild oats came up on that ground. I never intend to grow apples on limestone subsoil."

Mr. Curnow—"It is a difficult matter to get peas to grow in our district. Lupins have been tried on a limited scale, but have not been the success expected."

Mr. Barr (Pine Forest)—"Sixteen years ago I planted three or four acres of orchard. Ten years after the trees began to die back. When we should have expected good results all the profits seemed to be at an end. I attributed

the result to unsuitable soil. It is quite evident after hearing the paper that it is due to soil exhaustion."

Mr. Summers—"I know a lot of growers who thought they would prevent the trees from going back by keeping the ground in a high state of fertility by the application of fertilisers. Some of us, at any rate, are not certain about a direct profitable result following the application of manures. At the same time I do not want it to be thought that I do not believe in manures. We have seen the benefit in improved growth." Muriate of potash gives good results on limestone soil for the use of drill. If you want to get satisfactory results from using manures for fruit trees you must get the manures in to a fair depth. Unless you do that you encourage the roots to come up to the surface, and that, of course, would be a serious disadvantage. You must do a fair amount of digging. I should put it on the surface and plough it in. The roots would get more, and the weeds less."

Mr. Curnow—"I have used bone super. instead of mineral super. The whole of my orchard is not limestone ground. A great portion of it has plenty of really good clay."

Mr. Richardson (Assistant Director of Agriculture)—"There is a tendency to decry chemical analyses. That tendency is justified by results. Generally speaking, when soils are analysed and the results sent back to the grower they are just as badly off as they were before. There are three deficiencies in South Australian soil—phosphoric acid, potash, and nitrogen. All we can do is to experiment, and we must experiment along definite lines. One way is to have five test plots. Take every precaution to see that the results are properly tabulated. Unless that is done experiments are absolutely useless."

Mr. Summers—"One point to remember is that we must not attempt too much. If we have seven or eight plots, which would necessarily have to be of a fair size, with different trees, I am afraid we would have very considerable difficulty in getting the exact weights."

EXPERIMENTAL WORK.

Professor Angus delivered an address on "Experimental Work." In opening he said he did not intend to deal with the actual experiments being carried out by the department, although they would be touched on, but he wished more especially to refer to the general scope, the idea and object of work of an experimental nature. In a young country like this he said experimental work was necessary in order that the farmer might ascertain what modifications of the customs of older countries were advisable to suit the local conditions of soil and climate. Professor Angus divided experimental work into three classes, as follows :—Three classes of experimental work—
(a) Demonstration work. Teaching by plots. Impressing upon farmers who have not yet learned the lessons others have done how much to their

advantage it would be to turn to and do as others have done. Our experiments in manuring are of this class. (b) The application of general scientific principles of agriculture to our Australian farming system. Drainage. Principles of feeding, of breeding, &c. These have reference more to soil handling and management, the selection of crops, the improvement of stock, and even with these many are not so well informed as might be. (c) Research work—Tackling problems of local nature. Nitrification as going on in Australian soils. Working out life histories of local crop pests, &c., &c.

The third section so far had been neglected, but the time had now come when many problems which were met with in Australian agriculture must be solved on the spot, and the work of the department in the immediate future would be organised so as to admit of this branch of experimental work receiving more attention. With respect to classes (a) and (b) what was being aimed at was to bring under the notice of farmers the advantages of practices that had already been substantially proved to be of advantage to them. There were still a few people who did not use phosphates or who did not use them to the best advantage, and it was just because of these few people that the department had to continue to demonstrate the advantages of using phosphates, and also the quantities and kinds best suited to local conditions. Reference was made to the advantage of the farmer and the department combining, to the value of the publication of results of experiments, and to the advantage of the criticism and discussion of the Branches of the Agricultural Bureau. Professor Angus went on to say that applications were being received from every quarter from persons desirous of undertaking experimental work in connection with the department, and other States were following the lines upon which the work had been carried out. Experiments with respect to wheat-growing must take the premier place in a State like South Australia in which that industry predominated, and consequently experiments were being conducted in manuring for wheat, tillage for wheat, the best varieties of wheat for crop and for export, and the best varieties for flour for the baker, as well as the improvement of wheats by crossing and selection.

What was wanted in South Australia was an experimental farm—not a model farm, not a farm whose sole object would be to produce revenue; but a farm equipped with plant and conveniences handed over to the department in order to find out something more. Now, this conception of an experimental farm had never been realised in South Australia. The idea, so far, had been to run the place so as to make it pay and compete with the farmer—a farm to be run as a model like a model dairy. That was all very well, but entirely at variance with the true conception of what an experimental farm should be. A model farm was, to his mind, a very desirable institution, and might with great advantage be placed in each district of the State; but to run a model farm a trained expert was not required. What was required was a tidy, careful, good business farmer—

not a scientist, but one who would run the concern with neatness, care, and economy. But if these were wanted, call them model farms and put the right men in charge of them. If a farm was to be established for experimental purposes, then equip it for that work, leave it to do that work, and that work alone. Far better would it be to leave experimental work alone altogether than that our so-called experimental farms should be made into commercial concerns with the primary object of making revenue. Let there be an end to this continual call for balance-sheets. Even in South Australia the climatic conditions differed so much that it was necessary to have experimental farms in each district, such as the South-East, the North, Eyre's Peninsula, and the Lower North. These farms should be established with the idea of tackling existing problems, and of solving difficulties, and of developing agriculture on newer lines—in a word, for local research in agriculture. These objects could not be obtained in one or two years. The greatest experimental station in the world, Rothamsted, had been established for over 50 years, and the older it got the better were the results from it. Each place handed over to the department had first of all to be converted into a farm. Kybybolite was a sheep run, poor at that, covered with large gum and other trees and scrub ; the fences were useless, and the outbuildings unsuitable and rickety. For four years the efforts of the department had been directed to getting these put right, the land cleared, fences erected, outbuildings put up, the necessary stock and equipment provided, and in studying climatic and soil conditions. All these had cost money, and an increased capital account had been the result. He was glad to say that last year, for the first time, in desperation, an effort was made to make the place pay for the year, and they succeeded in paying 4½ per cent. on the capital outlay, and in having a small margin of profit of about £100 after paying for the expenses of management. If Kybybolite, however, was to be an experimental farm in the proper sense of the word, the production of a balance-sheet showing a profit was, he contended, out of the question and utterly wrong. The farm, or a fair proportion of it, was now in a condition to commence experimental work, and an exhaustive scheme had been drawn up for next year's work, but it would mean the expenditure of money. The same applied to the dry areas on the Murray. Before the farm could be put to its' proper use it must be cleared of fences, roots worked out, suitable buildings erected and equipped. The farm consisted of 4,000 acres of mallee country, 18 miles from the river, undulating in nature, and the midst of interminable scrub. The special object of the establishment of this centre was to test thoroughly the so-called system of dry-farming. There was nothing in that of a model farm, nothing of showing men how to tackle scrub on a minimum of capital. Supposing that by careful investigation it should be shown that by applying the dry-farming system to the land in the Loxton district wheat could be produced at a profit, then 600,000 acres of land would be open for population,

and it would yield on the average, say, 10bush. per acre, or 2,000,000 bags of wheat per year. This was certainly within the region of possibility, and certainly justified the expending of £10,000 or, say, £2,000 a year for five years. Even if it were found that dry-farming could not be carried out profitably in that district, he contended that the farm would have amply justified its existence if it demonstrated to the South Australian farmer that it was undesirable and risky to lay out capital in working land of that kind.

In answer to questions, Professor Angus said the Department intended to establish a farm on the West Coast, beyond the present terminus of the railway. A competent man would go over there and would carry out experiments from Fowler's Bay to Port Lincoln, and from Port Lincoln up to Port Augusta. The West Coast was to have an officer all to itself.

VOTE OF THANKS.

Mr. Smith (Angaston)—“I move a comprehensive vote of thanks to writers of papers and to the Chairman for presiding over these gatherings. This has been one of the most successful Congresses we have had. Not only from the point of view of numbers, but in the regularity of attendance.”

Mr. Malcolm—“I second the motion. We have gained a great deal of information, and we have to acknowledge the special courtesy shown by the officers of the Department of Agriculture.”

The motion was carried with acclamation.

The Chairman—“I thank you very much for the vote of thanks. I agree with you that the Conference has been a remarkably successful one.”



CONFERENCE OF HILLS BRANCHES OF THE AGRICULTURAL BUREAU.

The Annual Conference of the Hills Branches of the Agricultural Bureau was held at Uraidla on Saturday, October 9th, the following members being present :—Uraidla—Messrs. R. N. Cobbley, J. H. Snell, F. Y. Cobbley, T. Day, P. C. Day, W. Dyer, J. Rowe, F. Johnson, A. Richardson, E. Hawke, A. J. Gore, T. H. Collins, A. D. Moulds, E. Harfield, E. Hart, H. Hoffmann, S. Willsmore, and W. J. Kessel ; Forest Range—Messrs. Monks, Green, and Vickars ; Clarendon—Messrs. Burpee and Morphett ; Woodside—Messrs. A. Hughes, H. Rollbusch, R. P. Keddie, J. Drummond ; Longwood—Messrs. W. H. Hughes, W. Nicholls, J. Nicholls, E. J. Oinn, H. Vogel, and J. R. Coles. The members of the Advisory Board of Agriculture present were Messrs. J. W. Sandford (Chairman), G. R. Laffer, and J. Miller ; Department of Agriculture—Messrs. Geo. Quinn (Horticultural Instructor) and G. G. Nicholls. A number of visitors also attended.

OPENING ADDRESS.

The Chairman of the Advisory Board, in declaring the Conference open, said that the members of the Board were anxious to do anything in their power to further the interests of the men on the land in all parts of the State. The importance of facilities for marketing was mentioned. He thought that the Hills districts were capable of a greater range of production. In the line of dairying he could speak from experience, and claimed that the Hills could turn out produce second to none. He had received advice to the effect that at the British Agricultural Show—perhaps the largest agricultural show in the world—the Onkaparinga butter secured first place. There was a good market in the neighboring States for butter and eggs, and the demand increased more rapidly than the supply. The money to be made out of hog-raising should be realised. There were insufficient hogs available to keep factories going in full swing. Australia offered a good market, and there was also a demand for export. He strongly recommended them to take up the industry.

Mr. Cobbley, Chairman of the Uraidla Branch, presided throughout the Conference. In extending a welcome to the visitors he said they were pleased to see the Advisory Board of Agriculture representatives present and so many delegates from various branches. Each of them could learn something and teach something. None was too old to gain knowledge. He assured them that if they did a little less scratching and digging and a little more brain work they would win increased revenue.

ROTATION OF CROPS v. FALLOW.

Mr. W. B. Burpee, of the Clarendon Branch, read a paper on this subject. He wished it clearly understood that he was dealing with the Hills districts only. The principal aim in bare fallow was the conservation of moisture. As a general rule, it was not necessary to conserve moisture in the soil in the Hills, so that bare fallow from this point of view was of little value to them. He admitted that in practice a better crop was often realised after fallowing, but contended that the value of such crop would not be equal to the two crops which could be grown in the same space of time on the same land. Experiments carried out for a number of years showed that 12·7bush. was obtained where wheat was planted every year, and 17·1bush. where fallowed every other year. It was easily seen that cropping every year paid best in this case. If peas or clover had been grown every alternate year the difference would have been less still. One reason why a better crop followed bare fallow was that, unless the season was exceptionally wet, the nitrates were stored up and formed a good supply for the succeeding crop. In such a season as this, however, the nitrates would be washed out of the soil and lost. If a crop of clover were grown, instead of the land lying idle, the gain from the roots, stubble, &c., when ploughed in next year would more than make up for the food taken from the soil by the clover. Experiments conducted in England over a number of years showed that wheat after fallow gave 32·5bush., while wheat after clover yielded 39·5bush. In addition to the extra 7bush. of wheat, the clover crop cut nearly 4 tons of hay per acre. He considered, therefore, that the weight of evidence was in favor of rotation of crops, rather than bare fallow, in the Hills districts. To give the land a rest he would put it into grass for a number of years. As the land here required less moisture and more sun, it was a good plan to plough or cultivate the stubble at the first opportunity after the crop was removed. If the soil appeared to be getting impoverished, he would put in an early crop of rape or peas, and plough it in as green manure.

Mr. W. Hughes was in favor of summer fallowing, but considered winter fallow in the Hills was distinctly injurious. It was necessary for something to be done to stop the nitrates from being washed out of the soil.

Mr. A. Hughes said that as far as the Hills were concerned fallow was unworkable. Hardly any man now had bare fallow. The worst feature of bare fallow was that when worked down fine the surface caked very hard. He did not think it would pay to grow clover in the Hills. If instead of putting land to fallow it was devoted to growing pasture, a good profit could be made in dairy produce. Rape did well after wheat.

Visitors spoke of the benefit to be derived by growing fodder for dairy stock rather than putting land under fallow, and also referred to the need for better railway facilities to enable them to market produce and procure manures, &c., more easily.

REAFFORESTATION.

Mr. G. Monks, of Forest Range, read the following paper on this subject:—
‘ Nearly all the world over the cry goes up that the natural forests are being denuded of timber. Those interested in the timber trade are wondering where they are to get supplies in the near future. Unnecessary destruction of trees has been brought about by people who ought to know better. Not only are the trees of the forest the only source of the timber supply, but they also have a place in the economy of nature. The increase of rainfall, retention of moisture, climatic influence, health-giving influence, shelter for man and for stock all come under the head of benefits derived from growing timber. We as producers are guilty to a great extent of this destruction. I say with regret that wanton destruction of trees such as stringybark, blue gum, red gum, and others has gone on with no regard to results. This action has let in frosts, bleak south-east winds, and hot winds. In most instances the trees have been cut down without any attempt being made to replace them with others, such as Remarkable or Maritime pines, ash, oak, and eucalypti—particularly red and blue gum. In some countries there is a law which compels anyone who cuts down a tree to plant one in its stead. Whilst I do not advocate this, I do think that every man should do his best to bring about a better state of things. Each country district council should have its forest reserve on a small scale to supply timber as far as possible for the construction of bridges, culverts, &c. Back roads not suitable for vehicular traffic could be planted with useful trees. The Woods and Forests Department has paid some attention to forest culture. According to the latest statistics the total area planted is 164,113 acres, and the trees planted during the year number 58,571. The revenue is shown at £2,981, and the expenditure for the same year as £6,106, while the value of permanent improvements is given at £95,816. This does not represent the total planting operations of the department, as 6,713,787 trees have been given to 31,725 persons to plant. Due credit should be given for this. I do not hesitate to say that two or three times the area quoted should be planted, and the paltry sum of £6,106 expended during the term mentioned should be multiplied three or four times over. The revenue—nearly half the expenditure—is wonderful when it is remembered that the forest is a comparatively young one, and this should encourage any Government to spend much larger sums in this direction. The Americans appreciate the value of our timber, and are growing eucalypti in their forests. The late Conservator of Forests (Mr. Brown) stated that English trees grew about twice as quickly in Australia as in their home country. That, no doubt, accounts for the fact that already some of them in our very young forests are large enough for manufacturing purposes. When we consider the millions of pounds that are spent for timber imported into the Commonwealth, what splendid assets forests are, and what a vast area we have for forest culture, every individual instead of destroying timber should do the utmost to promote reafforestation.

A general discussion followed.

Mr. Rowe thought the district council back roads should be planted with timber. He considered that trees had been sent out by the Woods and Forests Department too young. They should have been kept 12 months longer, as they were not strong enough to withstand the extremes of climatic conditions in summer and winter.

Mr. Keddie thought discrimination was necessary to ensure planting suitable trees. There were some pines in Woodside which could have been had by anyone for the cutting down, but they were of so little value that no one would take them.

Mr. Laffer said this was a national question, and not merely one for the consideration of fruitgrowers. The pines referred to by Mr. Keddie, if of the size mentioned, should cut up £5 worth of timber for fruit case ends. There was a great deal of land on Kangaroo Island which should be planted with timber. Timber was necessary for the preservation of birds, such as the curlew, swans, and others, especially in view of the increased number of foxes in various parts of the state. The Tasmanian gums at Bundaleer, which were less than 25 years old, were sold to one of the mining companies at Broken Hill at from £2 to £3 each. Pines at this age would cut £5 worth of box ends. He would like to see the Government do a good deal more in this matter. It was not always easy for district councils to grow timber trees. The young trees had to be guarded, and £25 or £30 would not go very far in providing guards. Many people seemed to have little or no regard for trees when planted. He thought there was some fault in the educational system where children had no respect for property.

Mr. Rollbusch considered that in many cases it was not necessary to plant new trees if care was taken of those that spring up naturally. Gums of all sorts were valuable; they should not be sold for firewood. Farmers should allow trees to grow wherever possible.

Mr. Snell thought that councils should plant wattles on district roads. They could sell the right of stripping the bark, and thus secure a monetary return.

Mr. Pritchard spoke of the ever-widening range of industries which required timber for their existence. Paper and artificial cotton goods were made from wood pulp, and a substitute for silk was also largely made from timber in France. It was too large an undertaking for private individuals to deal with, and the Government should take it up with vigor.

Mr. Nicholls (Longwood) thought that land on either side of district roads should be planted with timber. Hundreds of acres of land were offered by the Government as homestead blocks which were utterly unsuitable for the purpose. These blocks should be devoted to timber-growing. The trees which were sent out by the department were too easily obtained, and consequently not properly valued by the recipients, and were not afforded the

protection which they needed when young. He thought the Government should insist on proper care being taken of the trees sent out, and should distribute literature on the subject to educate the people.

Mr. Dyer pointed out that trees could not easily be grown on district roads for timber purposes, but only for shelter and breakwinds. Timber should be grown on reserves.

THE NEXT CONFERENCE.

It was decided to accept the invitation of the Woodside Branch and hold the next Conference at Woodside.

CODLIN MOTH PARASITE.

Mr. Snell (Uraidla Branch) asked for information in regard to the codlin moth parasite—*Calliephialtes messor*, and read extracts on the subject from a book called "The New Earth."

Mr. Quinn said that efforts made in California to destroy the codlin moth by this means had proved a dismal failure. The eggs of the parasite had been successfully hatched in specially-constructed cages, but not in the orchards where they were required. Mr. Froggatt, who toured the world on behalf of several of the Australian States, could not find the parasite in California, although that was the State where so much was said and printed about it. Spain was the natural home of this parasitic fly, and when Mr. Froggatt inquired about it in that country he was informed that no apples were exported, as they were so badly affected with codlin moth they had to be turned into cider. Experiments in New Zealand had not been very satisfactory so far. Overtures had been made by the State Board of Horticulture of California to the South Australian Government offering a supply of the parasitic fly for the sum of £1,000, but in view of the fact that apples are sometimes imported from California it was considered that if at all effective in that country the parasite would be introduced naturally in the fruit imported, but, judging by the proportion of the Californian apples which arrive in Australia infected with codlin moth caterpillars, the parasite was not a very great success there.

SPRAYING.

Mr. Quinn (Horticultural Instructor) gave a short address on spraying. It was absolutely necessary, he said, that a man should know why he was spraying. The pests to be dealt with were all either vegetable or animal. The vegetable diseases, or fungi, might be roughly divided into two classes—those which penetrated below the surface of the plant, and those which grew on the surface, such as the mildews on the vine and rose. As a rule, the disease on the surface of the plant could be destroyed when seen by spraying or dusting with a suitable compound. Those pests, however, which worked below the surface within the tissues of the plant had to be proceeded against on entirely different lines. They must be prevented, i.e., steps must be taken

to destroy them before they made any appearance. This difference between the two must be studied and realised. The animal pests might be roughly divided into two kinds—"sucking" and "chewing." The sucking insects could not be poisoned. They must either be killed by stopping up their breathing apparatus or by destroying their outer covering or skin. For the eating or chewing insect it was necessary to poison what it was to eat in such a way that the person ultimately consuming the fruit should not be harmed. For codlin moth and other leaf-eating insects arsenate of lead was likely to supplant all other sprays. Among its advantages might be mentioned that there was no lime-mixing; it was easily prepared, and remained in suspension about 14 times as long as Paris green. In regard to the best arsenate of lead to use, he recommended obtaining that which contained not less than 15 per cent. of arsenic, not more than .75 water-soluble arsenic, and not more than 45 per cent. of moisture. For codlin moth the best time for the first spraying was as soon as the blossom had fallen. The poison must be sprayed into the calyx cups, and therefore he recommended a pump with a pressure of not less than 80lbs. to the square inch. It would be well to spray again within two weeks of the first time, and then cease for a month unless there was a great deal of rain. To destroy insects which lived by suction tobacco-wash, resin and soap wash, kerosine emulsion, and similar preparations might be employed. He was of opinion that the new Bordeaux mixture would come into general use as a fungicide because the old method of mixing with milk of lime was not the best. The procedure now recommended, on the authority of the Director of the Woburn (England) Experimental Fruit Farm, was as follows:— Dissolve 6lbs. 6½ozs. of copper sulphate (bluestone) in a few gallons of water, and in another vessel containing 100galls. of water put 2lbs. to 4lbs. quick-lime. This should be stirred well, to form a saturated solution of limewater. Add 80galls. of the clear limewater to the solution of copper sulphate previously prepared. After stirring, the mixture was ready for use. Mr. Quinn explained that the quantity of lime mentioned would be ample to form the limewater, as lime was only dissolved in water in the proportion of one part of lime to 700 parts of water. An investigation by Mr. Spencer Pickering, of the Woburn Experimental Fruit Farm, proved that the compounds formed by the action of lime on copper sulphate have shown that as many as six different substances may be present in Bordeaux mixture. That which is present when the mixture is made in the ordinary way by adding excess of lime in the form of a milk to copper sulphate is a double basic sulphate of copper and calcium. The carbonic acid of the air acts on this, forming carbonates and sulphates of the metals, and it is owing to the gradual reformation of sulphate of copper in this way that the mixture possesses fungicidal properties. But the basic sulphate of calcium present has to be decomposed before the basic sulphate of copper is attacked, so that a certain time always elapses before the mixture begins to behave as a fungicide.

This is a great disadvantage, but can be obviated by using only just sufficient lime to precipitate all the copper in the first instance, *for in that case a precipitate is formed which contains none of the basic calcium sulphate.* There is, further, a great advantage in reducing the lime used, for the basic copper sulphate precipitated is a less basic compound than that in ordinary Bordeaux mixture, and it liberates two and a half times as much copper sulphate by the subsequent action of the air; *so that a mixture as efficient as the ordinary one may be obtained with the use of only two-fifths of the copper sulphate,* thus effecting a great saving in the cost of the most expensive item in the mixture.” Mr. Quinn referred to a recommendation made in one of the weekly papers to mix bluestone with arsenate of lead to form a combined insecticide and fungicide, and warned growers against such a practice. Chemical compounds would be formed by such mixing which would be valueless as either insecticides or fungicides, and might do serious damage to the trees.

A MODEL ORCHARD.

Mr. E. W. Pritchard read the following paper:—“ Looking at the present state of Government aid to fruitgrowers, there seems to me to be a grave deficiency. We have our lecturing expert, the Produce Export Department, the Commercial Agent in England, the type orchard at Mylor, and the experimental orchard at Blackwood. All these are good in their way, but still there is something wanting to make the system complete. It is a model orchard, as the natural complement of the type and experimental orchards, for without it their work is incomplete—in fact, largely wasted. Now, what is meant by a model orchard as distinct from an experimental one? I would suggest that the Government purchase a piece of orchard land, and hand it over to Mr. Quinn to be planted with fruit trees, and as quickly as may be worked up into a commercial orchard. The expert should place a practical orchardist in charge as manager, who should give all his time to it and employ any labor necessary. The manager should be altogether under the direction of the expert, and the expert should be given a free hand to direct operations in the most approved way, as recommended by him in his lectures and in the various publications of the department. The orchard should be separate in finance as well as management from the rest of the department. Exact accounts should be kept of receipts and expenditure, including interest on the cost of the land and on all capital expended before the trees begin to bear. A careful account of all operations should also be kept, and a balance-sheet be published in the *Agricultural Journal* every year, showing the exact state of the finances, together with an account of the year's operations; in short, it should be, as an orchard, a model for every fruit-grower in South Australia to copy—Run to pay, and run so systematically that all particulars as to method, cost, &c., could be obtained by anyone without the least difficulty. The reasons why such a plan should be adopted

are—that it would be a practical demonstration of the more or less theoretical advice given us from time to time. There is no work in which the results are so uncertain and so difficult to forecast as agriculture. You may reason a thing out to a nicety, basing your arguments on previous experience, and even then you cannot be certain that the result will be what you expect. Even when a certain method answers on a small experimental scale, it does not always follow that it will have the same result on the large commercial one. The final test of every theory is whether it will pay under ordinary commercial circumstances. Now, the ordinary grower has learned this by bitter experience, and he is consequently very careful about taking advice that he has not seen proved practically. Only the exceptional grower can follow all the reasoning of a particular theory, especially seeing that it may touch on so many different subjects, including chemical equations, botanical names, &c. For these reasons it cannot be expected that the man with a small orchard and a living to make for his family is going to risk everything by adopting new, and to him unproved methods, when by keeping to the old ones he is certain of a fair return. In a model orchard such as is here proposed all that would be done for him once and for all, and no man, however conservative, could get away from the proofs, for he would see them practically demonstrated. Such an orchard would show whether the method advised would pay. As things are now we are told that we should spray for codlin moth six times a year, that we should cultivate the soil after every rain, &c. Now, that is all very well, and no doubt it will increase our crops and their quality; but that is not the question. What we want to get at is whether the increase is sufficient to warrant the extra expense. It seems to me that there is no serious obstacle to the establishment of one or more model orchards in South Australia, and there is every reason why they should be started at once.

THE NECESSITY OF A TESTING ORCHARD.

Mr. F. C. Smith (Aldgate) read the following paper:—"Most of us have long recognised that the type orchard at Mylor represents a practical attempt of the Legislature to assist us. We have been glad to see the samples of fruit produced shown annually at the two Royal Agricultural shows. We have been disappointed upon visiting the orchard itself at the lack both of sample fruit and the means to exhibit such. I understand that this matter will be remedied before the next fruit season, and we shall in future be able to make our selection of varieties with a view to scions for grafting with much more intelligence than hitherto. This is well so far as it goes; but the fruit industry itself requires something more than this. Having gone so far, the Government should go one step further. The main reason for the putting down of a type orchard was educational. It was plainly seen that private enterprise could not do the work, and that any one or more individuals attempting it would be simply working for the benefit of the whole body of

fruit-producers more than for their own profit. Now, at Mylor there are, roughly, nearly 3,000 varieties of apples and pears, and this list is periodically increased. Out of this immense number only a small proportion, naturally, give promise of any value at all for export—possibly 100 or more. For the export trade it is to this residue that we look for results. There is no possibility of the type trees ever producing a quantity sufficient to commercially test the oversea markets. For any private grower to attempt to practically test all these possibly valuable varieties would mean to him a most costly work, and he could not be blamed if he kept to himself the results gained at such cost. For a large number of growers to engage in the testing of any large proportion of these varieties it would mean a wasteful and costly duplication of work, and even then, unless the whole list of possibly useful varieties was tested, nothing absolutely conclusive would be reached, and the cost to the industry at large in the aggregate would be immensely greater than if the testing were conducted by the State itself for the benefit of all. Then the conclusions would be unquestioned, and the information supplied to the producers authoritative and useful. From 10 to 15 or 20 cases of each sort of keeping apples and pears would be ample as a commercial test before a pear or an apple could be safely placed in the first class or second class as an export fruit. An orchard of, say, 10 acres, part pears and part apples of about six or seven years of age, and situated conveniently for easy access by rail, and in good fruit-growing soil, is what is wanted. If such an orchard were purchased, or even leased for a term of years, at a good price, all these pears and apples, viz., the 100 or more, could be worked upon the trees, eight or ten trees of each sort being grafted. Within five years it would be shown pretty conclusively which were the few supremely good and valuable varieties. The advantage of the State doing this would be that the tests would be so well made and so carefully recorded and tabulated that once a decision was made it would be almost useless to look for further results from any rejected kind. They would be done with, so far as export value went. The 'proved good' ones would either supersede some of those now in vogue or fill seasons not possible to those now grown, or prove immune to pitting, splitting, scab, or other disabilities which some of our best apples and pears are subject to. Varieties specially suited to special markets would be noted carefully; the length of time of keeping after cold storage, and so on. These points would all help to determine the verdict in each case. The orchard record would show the cropping qualities and every other quality likely to be a factor in judging each sort. The first year's test would almost certainly relegate half of the varieties to the fire heap. The second year would add to the list of rejects. The third year's report from abroad upon the balance would with regard to the majority probably prove final—sufficiently so for the manager of the orchard to be able to say 'This or that sort is a thoroughly safe and sound fruit for you to grow,' and any

information in his power to give would be the common knowledge of all growers. The work of testing would naturally embrace remedies for pests, a study of the effects of stock on scion on a large scale, and other things which the private grower has not the time or opportunity to attempt. The rejected stock trees would then become available for a rapid testing of new sorts added to the type orchard, for instead of the manager of the test orchard having to wait till the typical orchard could furnish him with results he could utilise the first year's growth to graft one whole tree of every new sort. These coming rapidly into bearing would give commercial testing results years before they could be got otherwise. Not alone for the export varieties would the test orchard be of use, but to test those likely to be of service in our domestic Commonwealth markets, and for this purpose a single tree of each of the most promising would probably be sufficient. For the furnishing of scions of the proved varieties the test orchard would be most valuable, as a sufficiency of wood should be available to supply all wants. The tests to establish which of the finally-selected varieties would be best suitable to the conditions of all our apple and pear producing areas would probably have to be left to private enterprise. Where the whole industry of a State, however, is concerned, I think the case for a test orchard is more than strong enough to warrant our pushing it by every means in our power."

The two papers were discussed together.

Messrs. Vickers and Keddie thought that the great variation in the nature of soils and other conditions throughout the fruit-growing areas would render a testing orchard of little value. In 10 acres of land great differences of soil were found, and to achieve the object desired a testing orchard would be necessary every few miles.

Mr. Laffier thought that caution should be exercised before any recommendations were made. The present orchard at Mylor could furnish required information years before any such schemes as proposed. He thought that in the past the trees at Mylor had been pruned back too hard, and so did not produce the fruit which was required to demonstrate certain qualities and capabilities. He could not see that the schemes outlined would carry growers any further forward.

Mr. Quinn, in response to a request from the Chairman, outlined the work which was being done by the Department. Ten or 12 acres of land at Kybybolite were being planted with fruit trees to demonstrate what could be done in the South-East. Tests were also being conducted there with manures and cross pollination. To demonstrate the up-to-date methods of a commercial orchard, a full account of every penny expended and every minute of time taken up had been kept from the start. Four acres of land behind the old asylum on North Terrace were used as a nursery, and in it were planted practically every variety of grape vine grown in South Australia, so that people could go and see for themselves and judge as to the value of the exact

variety trained under four different methods. At Coromandel Valley the Department had about 40 plantable acres, and here work was in full swing. A little later on, when everything was plainly labelled so that visitors could see at a glance what the trees were, and why they were being grown, pruned, or treated in certain ways, they would be better able to appreciate what was being done than they could at the present time. He thought it would be a good plan to pick out the best varieties at Mylor Orchard and transfer them to Coromandel Valley. It was not, in his opinion, advisable to cut up a limited vote of money among a number of orchards. It was far better policy to have one or two orchards and do the thing properly. An orchard such as that suggested in the paper would be difficult to procure, and if found the price required for it would probably be quite prohibitive.

Mr. Nicholls (Longwood) strongly recommended the establishment of a model orchard to prove what varieties would pay to grow.

POTATO BLIGHT.

Mr. Rowe initiated a discussion on potato disease. Regarding Irish blight, he advocated thorough cultivation and not sowing potatoes too early. There was no need for alarm. He had not much faith in spraying or deep ploughing. Quicker-growing varieties were needed.

Mr. Quinn pointed out that the disease was not due to climatic conditions, but was facilitated by them. Those who planted potatoes without cutting them took very great risks. Cultivation made no difference, so far as Irish blight was concerned, except that the man who cultivated thoroughly would probably remove most of the rotten tubers that had been left in the ground. The spread of the disease was mitigated by wide planting. They should be careful about the sources of seed, and refuse to buy unless it was guaranteed to have come from a part where Irish blight was not known to exist. Spraying was a preventive of the extension of the trouble. If they desired a clean crop they must eliminate all suspicious indications.

Mr. Sandford said the wet winter had favored the disease. In the South-East, especially, hundreds of tons of potatoes had been water-logged. He feared that growers had been too careless in planting any seed that came along.

Mr. Quinn, by means of a microscope, illustrated various phases of the blight, and entertained growers for some time after the Congress had closed.

The Congress closed with a vote of thanks to the Chairman and the members of the Advisory Board for their attendance.

THE WHEAT MARKET.

The price of wheat at Port Adelaide remained at 4s. 6d. throughout October, and has now been at that figure since the 10th of August, while new season's is quoted at 3s. 10d. Last year the new season's business opened at 3s. 8½d., when the price of old season's wheat was 3s. 10½d. While there is a difference in South Australia of 8d. between old season's and new season's wheat prices the quotations of Australian old and new wheat on the English market show a difference varying from 5d. to 6½d. per bushel.

The wheat position at home is thus summed up by *Beerbohm's Evening Corn Trade News* in its issue of October 1st:—"There has been very little activity in the wheat market this week, but the recent movements in the trade have tended, we think, to show that a safe level has now been reached. The extraordinarily large shipments since August 1st (4,250,000qrs., against 1,360,000qrs. last year) have, of course, furnished the chief depressing factor in the market; but in spite of these record shipments the average weekly total for Europe has not been seriously, if at all, in excess of the requirements, which have naturally been increased by the absence of large supplies of native wheat both in this country and in Germany. The shipments from other countries have indeed been remarkably moderate, the total from America and Canada being only 2,270,000qrs. for the past eight weeks, against 3,900,000qrs. last year. This is a somewhat surprising result in regard to America's surplus, which had been generally expected to be very much larger than last year. Canada, it is true, will now be shipping no doubt quite freely; but her surplus can hardly be more than 8,000,000qrs., against 7,000,000qrs. last year, and 6,000,000qrs. in 1907, whilst from Argentina shipments of any importance are not to be expected until next January-February. The first appearances of reduced shipments from Russia will, therefore, no doubt give the signal for improving markets. There are several reasons for this opinion. First, from what we learn in regard to the percentage of unmillable wheat in this year's English wheat crop, we are likely to require to import the greatest quantity of foreign wheat on record, viz., 27,500,000qrs. to 28,000,000qrs.; the record is, so far, held by the season 1904-05, when 27,535,000qrs. were imported net. In the next place Italy is showing that she also wants far more foreign wheat than we had supposed early in the season; and thirdly the Roumanian surplus is smaller than was anticipated, and moreover is being practically all swallowed up by Hungary. The result of all these modifications in the position is that European requirements are likely to reach a total of 61,500,000qrs., which, added to the requirements of non-European markets, would make a grand total of 69,000,000qrs., or 1,325,000qrs. per week, including 1,185,000qrs. per week for Europe. With the apparent disappointment in America's surplus, and, with a probable smaller Argentina crop, there is, in our opinion, no likelihood of the exporting countries being able to export such a total, which would be about 8,000,000qrs. more than was actually exported last year. We believe, therefore, that there is justification for the growing impression that wheat is now very close to a safe level."

The latest English news as cabled to the daily papers states that enormous shipments continue to be received from Russia, and that reports are current that the Russian crop may be taken as 85,000,000qrs. instead of 73,275,009qrs. as previously estimated.

Date,	LONDON (Previous Day).			ADELAIDE.			MELBOURNE.			SYDNEY.		
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.
Oct. 4	—	..	..	4/6 ..	..	..	4/6 ^{1/2} to 4/7 ..	..	4/6 ^{1/2} to 4/7 ..	4/9 ; 3/10 ^{1/2} (n.s.)	..
5	Firm ; quiet ..	..	..	4/6 ..	..	..	4/7 ..	..	4/7 ^{1/2} (alongside) ..	4/9 ; 3/10 (b., n.s.)	..
6	Firm held, but inactive ..	..	..	4/6 ..	..	..	4/7 ^{1/2} ; 3/10 ^{1/2} to 3/11 (n.s.)	..	4/9 ; 3/10 (b., n.s.)	..	..
7	Firm ..	..	..	4/6 ..	..	..	4/7 ^{1/2} ; 3/11 (n.s.)	..	4/9 ; 3/10 (b., n.s.)	..	..
8	Firmer ..	..	..	4/6 ..	..	..	4/7 ^{1/2} ..	..	4/9 to 4/9 ^{1/2} ; 3/10 ^{1/2} to 3/11 (n.s.)	..	..
9	Dull, easier tendency ..	..	..	4/6 ..	..	..	4/7 ^{1/2} ; 3/11 ..	..	4/9 to 4/9 ^{1/2} ; 3/11 (n.s.)	..	..
11	—	..	..	4/6 ..	..	..	4/8 ; 3/11 ^{1/2} to 4/9 (b., n.s.)	..	4/9 (b., n.s.) ; 3/10 ^{1/2} to 3/11 ^{1/2} (b., n.s.)	..	..
12	Firmer ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/8 (alongside) ..	..	4/10 (b., n.s.) ; 4/- (b., n.s.)	..	..
13	Very firm ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/8 (alongside) ..	..	4/9 ^{1/2} ; 4/- (n.s., nom.)	..	..
14	Firm ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/8 (alongside) ..	..	4/9 ^{1/2} ; 3/11 ^{1/2} to 4/- (b., n.s.)	..	..
15	Firm; quiet ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/7 ^{1/2} to 4/8 ..	..	4/10 ; 3/11 ^{1/2} (b., n.s.)	..	..
16	—	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/7 ^{1/2} to 4/8 ..	..	4/10 to 4/10 ^{1/2} ; 3/11 to 3/11 (b., n.s.)	..	..
18	—	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/7 ^{1/2} to 4/8 ..	..	4/10 ; 3/11 ^{1/2} (b., n.s.)	..	..
19	Quieter ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/8 ..	..	4/11 ; 3/10 ^{1/2} & 3/10 (b., n.s.)	..	..
20	Dull, easier tendency; January, 4/9 ^{1/2}	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/7 ^{1/2} to 4/8 ..	..	4/10 to 4/10 ^{1/2} ; 3/10 (b., n.s.)	..	..
21	Dull, easier tendency ..	..	..	4/6 ; 3/10 (n.s.)	Dec.-Jan..	..	4/7 ^{1/2} to 4/8 ..	..	4/10 ; 3/10 ^{1/2} (b., n.s.)	..	..
22	Very dull ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} to 4/8 (s.) ..	..	4/10 ; 3/10 ^{1/2} (b., n.s.)	..	..
23	Steady; quiet ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} to 4/8 (s.) ..	..	4/10 ; 3/10 ^{1/2} (b., n.s.)	..	..
25	—	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} to 4/8 (s.) ..	..	4/10 ; 3/10 ^{1/2} (b., n.s.)	..	..
26	Quiet ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} (alongside) ..	..	4/10 ; 3/10 (n.s.)	..	..
27	Steady; quiet ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} to 4/8 ..	..	3/10 (b., n.s.)	..	..
28	Firm; quiet ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 ^{1/2} ..	..	3/10 (n.s.)	..	..
29	January, 4/8 ^{1/2} ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 to 4/7 ^{1/2} ..	..	4/10 to 4/10 ^{1/2} ; 3/10 (b., n.s.)	..	..
30	January, 4/9 ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 to 4/7 ^{1/2} ..	..	4/10 to 4/10 ^{1/2} ; 3/10 (b., n.s.)	..	..
Nov 1	—	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 to 4/7 ^{1/2} ..	..	4/10 to 4/10 ^{1/2} ; 3/10 (b., n.s.)	..	..
2	Quiet ..	..	..	4/6 ; 3/10 (n.s.)	..	..	4/7 to 4/7 ^{1/2} ; 3/10 ^{1/2} (b., n.s.)	..	4/10 to 4/10 ^{1/2} ; 3/10 (b., n.s.)	..	..

STEAMER FREIGHTS.—Port Adelaide to London, 17s. 6d. to 20s. per ton (5^{1/2}d. to 6^{1/2}d. per bushel); Port Adelaide to South Africa, 20s. per ton (6^{1/2}d. per bushel); Port Adelaide to Melbourne, 8s. per ton (2^{1/2}d. per bushel). Tramp steamers have been chartered for full cargo new season's loading, full range of Australian ports to United Kingdom-Continent at 20s. 3d. to 2/7s. per ton (8^{1/2}d. to 8^{1/2}d. per bushel). The market closes firm at the latter rate.
SAILER FREIGHTS.—During the past month a fair amount of sailing tonnage has been chartered from South Australia to United Kingdom.—Continental at from 22s. 6d. to 23s. 6d. to 24s. 6d. to 20s. per ton (7^{1/2}d. to 7^{1/2}d. per bushel) according to the age of vessel. A little business has been done to South Africa at 19s. 6d. to 20s. per ton (6^{1/2}d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for October, 1909, at the undermentioned stations, also the average total rainfall for the first ten months in the year, and the total for the ten months of 1909 and 1908 respectively:—

Station.	For Oct., 1909.	Av'ge. to end Oct.	To end Oct., 1909.	To end Oct., 1908.	Station.	For Oct., 1909.	Av'ge. to end Oct.	To end Oct., 1909.	To end Oct., 1908.
Adelaide	2·17	18·51	24·03	23·40	Hamley Brdg. . . .	1·59	14·58	18·78	16·49
Hawker	0·65	10·25	13·20	13·01	Kapunda	1·06	17·75	22·51	17·52
Cradock	0·64	9·33	11·31	11·40	Freeling	1·81	15·93	19·81	17·68
Wilson	0·63	10·06	11·88	12·96	Stockwell	1·73	18·23	21·24	19·39
Gordon	0·56	7·60	11·13	13·40	Nuriootpa	1·88	19·03	24·46	21·04
Quorn	0·80	12·01	13·98	15·22	Angaston	1·95	19·44	25·44	21·08
Pt. Augusta . . .	0·69	7·95	11·54	12·53	Tanunda	2·29	19·81	26·35	21·45
Pt. Germein . . .	0·69	10·76	13·97	17·59	Lyndoch	2·32	20·62	24·88	24·54
Port Pirie	0·80	11·32	12·80	16·07	Mallala	2·39	14·95	19·84	17·79
Crystal Brook . .	1·02	13·41	17·24	17·96	Roseworthy	2·04	15·53	20·18	17·04
Pt. Broughton . .	1·18	12·69	15·32	15·07	Gawler	2·05	17·29	23·23	17·85
Bute	1·48	13·72	16·25	17·92	Smithfield	1·93	14·55	19·95	19·54
Hammond	0·77	9·34	13·22	17·10	Two Wells	1·92	15·94	17·92	15·58
Bruce	0·56	7·67	10·17	18·76	Virginia	2·19	15·71	20·74	18·00
Wilmington . . .	0·83	15·76	19·05	24·43	Salisbury	2·34	16·55	21·59	18·22
Melrose	0·75	20·58	27·02	36·53	Teatree Gully . . .	3·00	24·81	34·33	34·78
Booleroo Cntr. .	0·67	13·88	16·16	19·23	Magill	3·38	22·78	33·42	28·29
Wirrabara	0·82	16·56	22·67	19·97	Mitcham	2·96	23·83	28·09	24·77
Appila	0·94	12·77	15·78	19·72	Crafers	5·77	42·34	61·23	49·17
Laura	0·90	15·67	22·10	26·13	Clarendon	3·84	35·96	39·46	30·70
Caltowie	1·07	14·95	17·07	22·96	Morphett Vale . . .	3·26	21·11	28·36	20·94
Jamestown	1·08	14·94	18·26	20·36	Noarlunga	1·94	18·30	25·25	21·29
Gladstone	1·04	13·86	15·60	20·58	Willunga	3·93	23·76	33·16	23·53
Georgetown	0·87	16·09	17·02	20·69	Aldinga	3·47	18·17	26·72	19·42
Narryd	0·95	15·00	15·18	18·08	Normanville	2·50	18·82	23·81	19·27
Redhill	1·26	14·60	18·77	21·76	Yankalilla	3·60	19·92	26·20	22·48
Koolunga	1·23	13·71	17·59	20·09	Eudunda	1·33	14·94	15·55	17·87
Carrieton	0·53	10·14	13·44	14·06	Sutherlands	0·49	—	10·87	—
Eurelia	0·61	11·24	12·98	17·20	Truro	1·87	17·39	22·96	20·69
Johnsbury	0·31	8·24	11·03	10·87	Palmer	1·99	—	16·43	14·37
Orroroo	0·55	11·64	13·19	14·92	Mt. Pleasant	3·24	24·66	29·23	27·17
Black Rock	0·55	10·19	13·52	14·76	Blumberg	3·90	27·12	32·53	30·10
Petersburg	0·45	11·00	12·45	16·07	Gumeracha	3·96	30·18	41·96	33·42
Yongala	0·71	11·75	13·44	15·76	Lobethal	4·27	32·96	43·01	34·00
Terowie	0·66	11·47	12·71	15·69	Woodside	5·21	28·71	41·56	33·15
Yarcowie	0·94	11·74	14·72	17·50	Hahndorf	4·29	32·53	40·15	34·11
Hallett	0·93	14·33	14·00	20·46	Nairne	3·79	26·32	34·68	26·49
Mt. Bryan	1·20	13·95	14·40	15·57	Mt. Barker	4·11	28·44	36·26	26·81
Burra	1·15	15·93	17·59	19·80	Echunga	4·23	29·86	42·99	30·81
Snowtown	1·52	13·93	17·64	20·98	Macclesfield . . .	3·98	27·72	34·29	29·16
Brinkworth	0·93	13·06	15·94	19·83	Meadows	4·54	32·28	43·07	32·95
Blyth	1·73	14·34	20·62	20·78	Strathalbyn . . .	2·87	17·18	26·41	19·85
Clare	1·77	21·93	27·30	27·01	Callington	1·90	14·15	18·59	15·11
Mintaro Cntrl. . .	1·49	19·99	24·31	23·20	Langhorne's B . . .	1·31	13·02	15·69	15·65
Watervale	1·77	24·70	30·27	29·85	Milang	0·90	15·05	17·05	16·68
Auburn	1·57	21·71	32·29	27·10	Wallaroo	1·36	12·45	16·89	17·40
Manoora	1·33	16·40	19·45	18·56	Kadina	1·26	14·46	18·58	16·77
Hoyleton	1·22	16·32	18·76	18·88	Moonta	1·46	13·71	19·18	17·16
Balaklava	1·27	14·19	17·01	17·74	Green's Plains . . .	1·54	14·32	18·92	20·17
Pt. Wakefield . .	1·33	11·67	14·14	15·52	Maitland	2·00	18·29	23·70	20·47
Saddleworth . . .	1·29	17·85	20·76	18·47	Ardrossan	1·64	12·54	16·05	17·76
Marrabel	1·54	16·07	24·05	19·44	Pt. Victoria	1·96	13·69	16·75	15·98
Riverton	1·80	18·42	23·73	19·58	Curramulka	2·32	17·24	20·70	15·05
Tarlee	1·26	15·52	19·56	15·66	Minlaton	2·31	16·04	18·98	14·43
Stockport	1·26	14·36	16·96	14·77	Stansbury	2·62	15·51	20·73	16·56

RAINFALL TABLE—*continued.*

Station.	For Oct., 1909.	Avg. to end Oct.	To end Oct., 1909.	To end Oct., 1908.	Station.	For Oct., 1909.	Avg. to end Oct.	To end Oct., 1909.	To end Oct., 1908.
Warooka ...	1.75	15.37	16.85	16.11	Bordertown .	2.93	17.58	20.93	16.56
Yorketown .	1.80	16.15	16.87	15.45	Wolseley ...	2.70	15.70	21.46	16.43
Edithburgh..	1.70	15.00	15.84	13.2	Frances	3.36	18.09	23.01	15.47
Fowler's Bay.	2.67	11.26	13.01	12.65	Naracoorte .	3.07	19.95	24.75	19.24
Streaky Bay.	1.65	7.420	17.45	13.78	Lucindale ...	3.11	20.82	26.80	21.43
Pt. Ellioton .	1.14	15.05	17.50	17.76	Penola	3.14	23.85	28.07	23.50
Pt. Lincoln .	1.18	18.54	17.46	18.41	Millicent....	2.68	26.29	36.60	26.74
Cowell	1.00	10.64	9.43	15.61	It. Gambier .	3.09	28.03	38.01	26.97
Queensclife .	1.47	16.86	17.70	16.48	Wellington ..	1.71	13.30	18.77	14.71
Port Elliot ..	2.05	18.71	18.52	17.46	Murray Bridge	1.42	12.40	18.64	13.86
Goolwa	1.86	15.96	22.33	18.06	Mannum ...	0.87	10.43	13.04	20.71
Meningie....	1.86	17.09	22.99	17.18	Morgan	0.54	7.62	7.83	7.51
Kingston....	2.01	22.09	28.48	25.07	O'rland Corner	0.49	9.43	8.92	12.01
Robe	2.22	22.59	28.46	21.99	Renmark....	0.49	9.14	10.18	9.01
Beach port...	2.78	24.69	36.01	24.70	Lameroo ...	1.11	—	16.65	17.16
Coonalpyn ..	1.90	15.67	21.50	15.81					

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,300 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, North Terrace, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

The Government Produce Department reports November 1st, 1909:—

Eggs.—Rates ruling for the fresh article in Sydney and Melbourne are so close to Adelaide prices that shipment from South Australia at a profit is not possible at present. Perth also is not operating to any extent owing to a strong local flush. Last year at this time eggs were 8½d. in Adelaide; they are 8¾d. this year at same period, and there is no outlet at any trading profit.

BUTTER.—The demand for butter this month has been very good, both locally and otherwise, and though cream has been coming in very well, and bears comparison with last year, the output has been so good that there are no stocks on hand, and prices have kept firm during the whole of the month, with the exception of Superfine Butter, which eased a ¼d. Given that the weather continues favorable, there is every prospect that November will be equally prosperous. Market quotations of the day—Superfine, 10⅓d.; pure creamery, 10d.

Messrs. A. W. Sandford & Co. have supplied the following quotations for November 1st:—

WHEAT.—Shipping parcels f.o.b. at Port Adelaide, nominally 4s. 6½d. to 4s. 6¾d. per bushel of 60lbs.

FLOUR.—City brands, £10 15s.; country, £10 10s. per ton of 2,000lbs.

BRAN.—11d. to 11½d.; pollard, 1s. to 1s. 0½d. per bushel of 20lbs.

OATS.—Local Algerians, 1s. 7d. to 1s. 8d. per bushel of 40lbs.

BARLEY.—Cape, 2s. 4d. to 2s. 5d. per bushel of 50lbs.

CHAFF.—£3 2s. 6d. to £3 5s. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £3 15s. to £4 per ton of 2,240lbs.

ONIONS.—Nominally, £8 to £8 10s. per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 9½d. to 10⅓d.; choice separators and dairies to second-grade factories, 8d. to 9d.; fair quality dairies, 7½d.; stores and collectors, 7d. to 7½d. per lb.

CHEESE.—Factory makes, 5½d. to 6d. for large to loaf, new make; matured up to 8d. per lb.

BACON.—Factory cured sides, 8½d. to 9d. per lb.

HAMS.—11d. per lb.

EGGS.—Loose, 8¾d. per dozen.

LARD.—Skins, 7d.; tins or bulk cases, 6d. to 6½d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb.; dark and ill-flavored, 1d. to 1½d. per lb.

BEESWAX.—1s. 1½d. per lb.

ALMONDS.—Soft shells, Brandis, 7d.; mixed soft shells, 5½d. per lb.; kernels, 1s. 3d. per lb.

LIVE POULTRY.—Good table roosters, 3s. 3d. to 3s. 11d. each; light cockerels, 2s. 3d. to 3s.; hens, 1s. 8d. to 2s. 4d.; ducks, 2s. to 3s.; medium to good geese, 3s. 6d. to 4s. 6d.; pigeons, 7½d.; turkeys, 10⅓d. to 11½d. per lb. live weight, for fair to good table birds.

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Nov.	Dec.			Nov.	Dec.
Amyton	356	—	—	Meningie	*	27	25
Angaston	+	27	25	Merghiny	*	—	—
Appila-Yarrowie	*	—	—	Millicent	370	9	14
Arden Vale & Wyacca	+	—	—	Miltalie	†	6	4
Arthurton	*	—	—	Minlaton	*	6	4
Balaklava	*	—	—	Moonta	*	—	—
Beetaloo Valley	*	—	—	Morchard	*	—	—
Belalie North	*	20	25	Morgan	*	27	—
Bowhill	*	—	—	Morphett Vale	*	—	—
Brinkworth	*	23	21	Mount Bryan	*	—	—
Bute	†	23	—	Mount Bryan East ..	*	6	4
Butler	360	—	—	Mount Gambier	371	13	11
Caltowie	*	22	20	Mount Pleasant	*	12	10
Carrieton	†	25	23	Mount Remarkable ..	357	25	23
Cherry Gardens	366	23	21	Mundoora	*	—	—
Clare	†	26	24	Nantawarra	359	24	22
Clarendon	366	22	27	Naracoorte	*	13	11
Colton	*	21	25	Narryd	†	—	—
Coomooroo	356	29	—	Northfield	359-60	23	—
Coonalpyn	*	—	—	Orroroo	*	—	—
Cradock	*	27	—	Parrakie	364	6	4
Crystal Brook	*	—	—	Paskerville	*	27	25
Cummins	*	27	25	Penola	371	13	11
Davenport	357	—	—	Penong	362	13	—
Dawson	357	—	—	Petina	†	20	—
Dingabledinga	*	12	10	Pine Forest	†	23	21
Dowlingville	*	—	—	Port Broughton	*	26	24
Forest Range	*	25	23	Port Elliot	369	2C	18
Forster	362	27	25	Port Germein	*	—	—
Fowler Bay	*	20	25	Port Pirie	358	—	—
Frances	*	—	—	Quorn	*	—	—
Freeling	359	—	—	Redhill	*	20	18
Gawler River	†	—	—	Renmark	365	—	—
Georgetown	*	27	25	Rhine Villa	*	—	—
Geranium	363-4	27	25	Riverton	*	27	25
Golden Grove	*	25	23	Saddleworth	*	19	17
Goode	361	—	—	Salisbury	*	—	—
Green Patch	361	22	20	Shannon	*	—	—
Gumeracha	†	22	20	Sherlock	†	27	—
Hartley	*	—	18	Smoky Bay	*	—	—
Hawker	†	27	24	Stansbury	*	—	—
Inkerman	*	25	23	Stockport	360	22	27
Johnsburg	*	—	—	Strathalbyn	*	15	20
Kadina	*	6	4	Sutherlands	*	—	—
Kalangadoo	†	13	11	Tatiara	372	—	—
Kanmantoo	†	26	24	Uraidla and Summert'n	†	1	6
Keith	369	—	—	Utera Plains	†	27	25
Kingscote	367	1	6	Virginia	*	—	—
Kingston	*	27	25	Walkerie	365	—	—
Koolunga	*	23	21	Watervale	*	—	—
Koppio	362	25	23	Wepowie	*	—	—
Kybybolite	*	25	23	Whyte-Yarcowie	†	27	—
Lameroo	364	—	—	Wild Horse Plains ..	*	—	—
Lipson	*	—	—	Willunga	*	6	4
Longwood	367	24	22	Wilka watt	*	—	—
Lucindale	*	—	—	Wilmington	*	25	23
Lyndoch	*	—	—	Wirrabara	357	6	—
Maitland	*	6	4	Woodside	†	—	—
Mallala	*	1	6	Yallunda	*	—	—
Mannum	*	27	25	Yongala Vale	358	27	25
Meadows	367	—	—	Yorketown	*	13	11

* No report received during the month of October.

† Only formal business transacted at the last meeting.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

Formal Reports.

The chief business transacted at many of the Branch meetings during the past month has been the reading of reports of Congress by the respective delegates. The practice of delegates furnishing reports of their impressions of the Congress is a good one, and should be encouraged by the Branches; in fact, it should be looked upon as the duty of delegates to furnish such reports. In view, however, of the fact that a full report of the Congress is published in the *Journal* we are unable to reprint delegates' reports, and these, therefore, appear in the list of "formal reports." It might also be mentioned that reports of addresses by officers of the Department and of gentlemen representing firms or companies must, under ordinary circumstances, be classed as "formal."—[Ed.]

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Amyton, September 28.

(Average annual rainfall, 11½in.).

PRESENT—Messrs. Donoghue (chair), Gum, Ward, Griffin, Crisp, Wallace, Brown, Baumgurtel, and Thomas (Hon. Sec.).

ENSILAGE.—Mr. Forder's paper on this subject, which was read at Adelaide Congress, was discussed. None of those present had had experience with chaffed ensilage, but some had been successful with long ensilage. It was realised that dairymen must pay attention to this question if the cows were to pay in the summer and autumn.

Coomooroo, October 4.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Berryman (chair), Jas. and Jer. Brown, H. and L. Avery, Brice, Polden, Hall, Phillis, and Kildea (Hon. Sec.).

WORKING FALLOW.—A discussion on this subject took place. Mr. Brice considered that the growth should be fed off by sheep before working fallow, as the roots were then more easily torn up and killed. Mr. Berryman thought that sheep should be shorn first, as otherwise the wool got so dirty. Mr. Hall was of opinion that the grass ought to be eaten off before fallowing at all—this went a long way towards getting clean fallow. Mr. Polden would harrow the fallow before working as it was then more successfully treated on account of being level. Mr. Brown regarded cross harrowing as the best means of levelling. In crossing the ridges the hollows were filled. Rolling fallow did not meet with general approval owing to the fact that it only broke up clods of a certain nature. Other clods were pressed into the ground, and remained practically impervious to water. It was mentioned that spiked rollers were used in West Australia. Mr. Brice considered that skim ploughs killed the weeds better than cultivators, as after rain they took root again when the latter implement was used. Mr. Jas. Brown said the best crop in the district last year had been cultivated with a disc implement and afterwards drilled.

HAYSTACKS.—Covering stacks was thought to be an economy, either with a thick straw thatch or with galvanized iron put on in sections. When a sheaf blew off a stack the opening made let in a considerable amount of water.

BUREAU WORK.—The Hon. Secretary read an interesting paper on the value and work of the Bureau, and pleaded for activity on the part of the members in contributing papers and taking part in free and fair criticism. The Bureau was of great value to the individual members and the State as a whole.

Davenport, October 7.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Bothwell (chair), Roberts, Bice, Messenger, Hobby, Gosden, Hewitson, Holdsworth, and Lecky (Hon. Sec.).

VETERINARY SURGEONS.—A discussion on the subject of veterinary surgeons took place. Members agreed that all stock inspectors should be duly qualified veterinaries. If this were the case, they considered, all requirements would be met.

Dawson, August 20.

(Average annual rainfall, 10½in.)

PRESENT.—Messrs. Renton (chair), Smart, J., J. A., and F. Wilson, C. H. and H. L. Meyers, Burden, Hughes, Baker, and Nottle (Hon. Sec.).

FEEDING HORSES.—A general discussion took place on the question of proper feed for working horses. Most of the members had been unable to keep teams working all day when fallowing, as they had not sufficient hay to keep the animals up to it. It had been necessary to feed wheaten chaff, and this with plenty of bran and pollard had kept the horses fairly well. Members considered that working horses should be fed with hay, chaff, crushed oats, bran, and pollard, and that they should not be in harness for a longer period than five hours without food and water. It was mentioned that growing Cape and Algerian oats left the land very dirty with weeds; wild oats were said to be worse still in this respect. All those present agreed to try and grow sufficient hay for their own use. Members realised that to be successful they must keep abreast of the times, and purchase new machinery as soon as the old was becoming too heavy for quick working, and that the horses must be kept in good condition if they were to do satisfactory work.

Mount Remarkable, September 23.

(Average annual rainfall, 21in.)

PRESENT.—Messrs. Yates (chair), Smith, McIntosh, Morrell, George, Bauer, Casley, and Lambert (Hon. Sec.).

THE SHARE SYSTEM.—Some discussion took place on the share system in farming. Mr. Casley thought that working land on halves was a good system to work on. Members agreed that it was good on the splendid land of this district, and many participants were put on their feet by it.

Wirrabara, September 25.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. Curnow (chair), H. E., J., and A. Woodlands, C., J., and E. Hollett, W., W. H., and E. J. Stevens, Marner, Pitman, and Lawson (Hon. Sec.), and one visitor.

POTATO-GROWING.—Mr. H. E. Woodlands read a paper on this subject to the following effect:—The best soil for potatoes was a friable sandy loam which would not set hard with irrigation. If such a soil was poor it must be enriched with farmyard and other manures. The best manure for potatoes was sheep manure. He would plough the ground 6in. or 7in. deep, well pulverise it by harrowing and cultivating, and then spread farmyard manure over it at the rate of 20 tons to the acre. If only commercial fertilisers were used a good mixture was 1cwt. sulphate of potash, 1cwt. sulphate of ammonia, and 6ewts. of superphosphate per acre. Half the quantity of farmyard manure and half of the other would give still better results. After spreading the manure the soil should again be well cultivated to a depth of 5in. or 6in. to thoroughly mix soil and manure. The soil should now be as fine as a sawdust heap and be ready for planting. “Up-to-date” and “Bismarck” were the two varieties that seemed to be most suitable for the Northern District. He would always select the biggest and best potatoes for seed and cut them into sets, with one eye in each set. If two eyes were close together it was best to destroy one with the point of the knife. Each set should be, say, 1in. or 1½in. through. If sets had two or three eyes the result would be as many stalks, a large number of tubers, but of small size. In this district from the middle to the end of August was a good time to plant. The rows should be 2ft. apart, with 10in. to 12in. between the sets, which should be 4ins. deep. If the ground had been properly prepared the planting could easily be done with one horse and a single-furrow plough. It was necessary to give the surface a light raking after the plough to make it level. From 7ewts. to 8ewts. of seed would be required to plant one acre. As soon as the plants were above ground he would hoe between the rows to destroy weeds and keep the surface loose. When the plants were high enough they should be moulded up. Watering was necessary if the weather was dry, and should be done twice a week till the potatoes were ready to dig. Potato-growing was not worth while attempting unless a good supply of water was available. The summer crop should be planted in this district about the first week in February, and, as stated previously, the earlier crop in August. In reply to a question, Mr. Woodlands said he could not recommend planting small potatoes.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Port Pirie, September 25.

(Average annual rainfall, 12 $\frac{3}{4}$ in.).

PRESENT.—Messrs. Hawkins (chair), Munday, McEwin, Stanley, Welch, Teague, Johns, Wilson, and Wright (Hon. Sec.).

REPORT OF CONGRESS.—Mr. Stanley, referring to the examination of stallions, did not agree that South Australia was a dumping ground for stallions which were rejected after examination in the other States. He had known of horses coming to this State, with Victorian certificates of soundness, being rejected by the South Australian authorities. It was unsafe to purchase horses in the other States on this account. He considered that certificates of soundness given by *bona fide* veterinary surgeons in the other States should be accepted by the local authorities.

BLACK RUST AND TAKEALL.—Mr. Johns took exception to the statement made by Professor Perkins at the Congress with reference to "black rust" on Gluyas wheat. Mr. Perkins said he regarded this variety as practically a rust-proof wheat, and he had not found it any more susceptible to "black rust" than other varieties. Gluyas wheat on his farm was this season badly affected with black rust. Mr. Munday had seen Gluyas badly affected with black rust at Roseworthy College.

[In speaking of Gluyas as practically rust-proof, Professor Perkins was referring to red rust and not to the so-called black rust, which is a "smut" and not a rust. Professor Perkins says he has never noticed flag smut to any serious extent on the College crops. Gluyas has been affected by it, but so have other varieties. In some seasons Gluyas has been free, while other varieties have been somewhat severely affected.—Ed.]

The Chairman referred to the prevalence of takeall this season, and it was decided to ask that an officer of the Department of Agriculture should visit the district to investigate the disease.

FARM MANAGEMENT.—Mr. Munday's paper on this subject (printed in October *Journal*) was discussed. Mr. Stanley was in favor of smaller holdings; the country would be much more prosperous if the large estates were cut up. In the settled districts of the State a comfortable living could be made on five or six hundred acres. Referring to the feeding of foals, he considered good hay was all they required, and did not believe in feeding them on bran and oats. Mr. Johns favored farming on the three-course system where suitable conditions prevailed; but owing to the sandy nature of a large portion of the land of this district it was unwise to follow out this system because of sanddrift. He considered that if foals were grazed on good grass country, feeding them on bran and oats was unnecessary. Mr. Teague considered that by adopting the three-course system the fertility of the land would be maintained, but he advised keeping straw on land that was liable to drift. He thought 12 horses sufficient to work a farm of 900 acres. Mr. Munday agreed that a comfortable living could be made from a farm of about 500 acres; but, in view of the fact that a farm of this size would take 12 horses to work, considered that the expense would be too great in proportion to the return. The three course system would, over an extended area, prove the most profitable.

Yongala Vale, October 23.

(Average annual rainfall, 13 $\frac{1}{2}$ in.).

PRESENT.—Messrs. Battersby (chair), F. and H. Miller, Chigwidden, Simon, Daly, Marshall, C. and E. Fowler, Travers, Cooper, Eliot, Schmidt (Hon. Sec.), and four visitors.

ROSEWORTHY COLLEGE FARM.—Mr. Battersby reported on his visit to the Roseworthy College Farm, describing in detail the method of cultivation, manuring, and rotation of crops employed; and from the impressions gained members were of opinion that the institution was a very valuable asset to the State. In the long and interesting discussion which followed it was pointed out that visiting day at Roseworthy would be a greater success and more beneficial to the visitors if they were divided into parties of, say, 50, each party having a competent man to show them over the farm. There would be less hurrying and more information gained than when each visitor was left to himself.

ADULTERATION OF SEEDS AND MANURE.—One member had bought a large quantity of German lucerne seed and sowed it, but, although it had been guaranteed pure and free from weeds, nothing but foreign weeds were growing. Members agreed that it would be a good plan to send samples of such seed to the Department of Agriculture for examination so that steps might be taken to prevent the evil of the introduction of foreign weeds. This would also apply to adulterated manures. [Samples of imported fertilisers are tested throughout the season to ensure their being up to the standard of the guarantee, and the results of the analyses are published in the *Journal* from time to time.—Ed.]

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Freeling, October 8.

(Average annual rainfall, 17 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Bailey (chair), Wehr, Kleinig, Heinrich, Neindorf, Koch, Peters, A. and G. Elix, Neldner, Keane, H. and A. Mattiske, Noske, Schuster, Steinfelkt, Block (Hon. Sec.), and one visitor.

HAY PRODUCTION.—Mr. Neldner read a paper on this subject. He considered that, as a rule, farmers worked the fallow too much in this district, and that the less the working the better the yield would be, as long as the weeds were kept down. He preferred having the black soil on the rough side rather than too fine, as the clods were a protection from frosts when the plant was young and delicate. The early crops, put in immediately after the first rains, would give the heaviest yields as well as the best quality hay. Seeding should be completed not later than May 15th in this district. Seed wheat was an important item, and was treated far too lightly by most farmers. They should obtain the best and cleanest seed wheat possible, and the price should be no object in this respect. Seed from red and sandy soil had given him the best results Baroota Wonder (two thirds with one-third oats) produced a fine sample of good solid hay, and undoubtedly the best for chaff for export purposes. Tuscan and Dart's Imperial retained a good green color right to the butt and these three kinds he would thoroughly recommend. From hay which retained a good green color the merchant was able to cut a good sample of chaff suitable for the inter-State market. This would always realise better values than a light-colored sample, and the merchant would thus be able to give the best price for hay. There were several other good wheats not to be overlooked, such as Majestic and Leak's Rustproof, as well as Curley's Early. This last was a particularly early kind, and often worth 2s 6d. to 5s per ton more than others because it was ready for market early. In regard to the quantity of seed to sow per acre, he considered 2 bush of good-graded wheat a fair average, with 100 lbs. manure. Guano super., Lion brand Japanese manure, Mount Lyell, and Shirley's manures could be recommended for this district. When the ground had sufficient moisture he preferred drilling before the scarifier, but if dry conditions prevailed he would drill in after the scarifier.

Nantawarra, September 30.

(Average annual rainfall, 15in.)

PRESENT—Messrs Smith (chair), Nicholls, Dixon, Herbert, Sinclair, Sutton, Sleep, and Gosden (Hon. Sec.).

POULTRY ON THE FARM.—Mr. Sutton read a paper on poultry-keeping:—The two breeds he recommended were white leghorn and silver wyandotte. The former, while acknowledged to be the best all-round layer, did not, in his opinion, lay as well as the heavier birds in the winter. The fowlhouse should be of galvanized iron, and should be whitewashed twice a year. A portion of the yard could be portioned off [and roofed].—[En.] as a scratching pen, as scratching was necessary to keep the fowls healthy. After the breeding pens had been mated for about three weeks the eggs should be fertile and free from any cross. If an incubator was used the worst feature was rearing the chicks. He, therefore, favored setting wyandotte hens. They made good mothers, and if put under a coop with the chicks and provided with cracked grain and fresh water, required very little further attention. Laying hens should be provided with plenty of litter to scratch, and the grain should be thrown into it. Drinking vessels should be washed out every morning. Plenty of clean fresh water, kept in a cool place, was essential, and a few of Condy's crystals put in once a week made an excellent tonic. There was no reason why most farmers in this district could not grow a small patch of lucerne for the fowls. It was an excellent feed in summer. Plenty of grit, charcoal, and green stuff were important items. The keeping of these simple rules was the secret of profitable poultry-farming. Mr. Sleep thought that poultry on the farm paid when plenty of waste grain was available, but when grain had to be purchased for fowls it was a question whether they would pay. Others present were of opinion that properly managed poultry could be kept on the farm at a profit, especially in view of the higher values which now ruled for eggs.

Northfield, September 30.

(Average annual rainfall, 19in.)

PRESENT—Messrs. Williams (chair), Dall, Kemp, Wright, Goldney, Rowe, and Mitchell (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Goldney.

STOCKING HAY.—Following the report of delegates to the Congress, a discussion took place on the question of stocking hay, in which most of those present preferred round stooks to long ones. While the latter were better to pitch from, the former kept the hay in better condition and enabled it to withstand the weather.

MANURE FOR FRUIT TREES.—Some little discussion took place on this subject. It was stated by one member that a mixture of bonedust and super. or bonedust and guano was superior to ploughed-in peas or other vegetable matter.

Northfield, October 26.

(Average annual rainfall, 19in.)

PRESENT—Messrs. Williams (chair), Goldney, Dall, Kemp, Kelly, and one visitor.

SUMMER FODDER.—Mr. Kelly read a paper on summer fodder as follows:—“It is necessary for the general health of our live stock that we provide green food for them during the summer and autumn. This is best done, especially as regards milking cows, by growing such crops as maize, amber-cane, &c. To ensure a good germination of the seed the land should be fallowed early, say in July, and kept well worked until time for sowing, which should be in this district in the early part of October, for if sown too early it is liable to suffer from rough, cold weather, just as it is coming up, receiving a check to the growth, whereas with the later sowing all danger of cold weather is over. If the land is well worked to a fine tilth, and the seed drilled in and rolled, it will be found that there is quite enough moisture in the soil to start it, and it is surprising what a little rain will keep it going. It is a good plan to sow in drills 2ft. 6in. to 3ft. apart, and as soon as the rows are visible run the horse hoe through it. I have had maize grown under these conditions of working over 7ft. in height, and from only half a bushel of seed sown cut enough fodder for half a dozen cows for nearly six weeks, so that it will be seen that the cost is only a trifle. Some may object to maize because it will not shoot again after being cut, while amber-cane may be cut two or three times, but if we sow a small quantity, say, every three weeks we can have maize to cut right away into January and February, and for producing plenty of rich milk it is easily top. Amber-cane will come in after the maize is done, and is a very useful fodder, as it may be cut two or three times. It should never be fed to stock until the seed is beginning to turn, as there seems to be some property in the plant in a green state which is injurious, and may even cause death. Horses are very fond of it when in seed, and I have seen my own horses running on it get fat and thrive well. One acre of each, maize and amber-cane, drilled in as described will produce more than ten or even twenty times the quantity slummed in. Rough and careless work only spells failure.” Members generally agreed with the views expressed in the paper.

Stockport, October 28.

(Average annual rainfall, 16in.)

PRESENT—Messrs. Nairn (chair), Stribling, Smith, Godfree, Vogt, Rodgers, Connolly, Bald, J. and F. Watts, Stevens, Whitelaw, Murray (Hon. Sec.), and two visitors.

VETERINARY SURGEONS.—Some discussion took place on this subject. Mr. Megaw thought veterinary surgeons might be stationed in various districts, and their services be paid for by a rate on the land. Mr. Smith thought this district might start it by calling a ratepayers meeting and guaranteeing a veterinary surgeon, say, £150. Mr. Murray did not think any veterinary surgeon would settle in a district on a retainer of £150, but the idea might be worked by several districts co-operating. Mr. Whitelaw thought a better way would be for classes to be formed in various centres and meet, say, once a month to take lessons from a veterinary surgeon.

WESTERN DISTRICT.

Butler, September 27.

(Average annual rainfall, 13in.)

PRESIDENT.—Messrs. Tremberth (chair), Butler, Easter, Phillis, Morrison, Parker, and Jericho (Hon. Sec.).

SOILS OF THE DISTRICT.—Mr. Tremberth read a paper on soils, and tabled samples for inspection. The soil known locally as white sand was generally found growing high broom and “tangled” mallee. This was easily rolled, and generally speaking the farmer could get

a good clean burn. This soil held the moisture well, and would grow a good crop. After the first crop, unless a good burn could be brought about, it was of little use cropping again until fallowed. He had tried drilling seed on stubble land. The crop looked well until July, when the undergrowth made headway, and the crop fell back. Raking the straw and ploughing gave a better result, but would not pay as a general rule. Last year he fallowed 200 acres of white sand. Half of this he ploughed again without the mould boards, as the land seemed in need of loosening without being turned. This was drilled with 55lbs. of wheat and 88lbs. manure per acre. After drilling the plot was harrowed. Four different brands of super. were used as a test, viz., Japanese, Mount Lyell, Mineral, and Wallaroo, but no difference was noticeable in the crop. Takeall was in evidence in places. The other 100 acres was harrowed before and after drilling; 55lbs. of wheat and 50lbs. super. was used. There appeared to be every prospect of a good crop. The sand known locally as "pinky" was much the same as the foregoing, but a little better for wheat-growing. The grey soil after a scrub burn would grow a crop rapidly, provided it was put in in good time and there was plenty of rain. If, however, there was no rain when the wheat was coming out in ear it was likely to blight. This soil did not hold the moisture as well as the white sand, but the more it was worked the better it became.

Goode, September, 21,

PRESENT—Messrs. Tonkin (chair), Watson, Simons, Clement, Nicholls, Hughes, Will, Lynn (Hon. Sec.), and four visitors

MELILOTUS PARVIFLORA.—Mr. Watson tabled a fine sample of King Island lucerne or melilot (*Melilotus parviflora*). This was grown in the wheat crop, and had made splendid growth. Mr. Watson considered it a splendid plant to sow on land which was to be left out the following year for grazing purposes. It made rapid growth with early rains, and would carry a good number of stock. If fed down early the plant became stronger, and by taking the stock off towards the end of August a crop would mature which could be cut for hay. Members wished to know whether this plant was likely to become a nuisance in the wheat fields.

[This plant is often troublesome in the cereal crop in the South-East and in New South Wales, and probably farmers in a wet district would have similar experience. Even on Yorke Peninsula it is said that since the introduction of superphosphate this plant has grown much more vigorously than was the case in former years, and has sometimes been a nuisance. The plant is fully described in the September, October, and December (1907) issues of the *Journal*. —Ed.]

Green Patch, September 30.

(Average annual rainfall, 26in.)

PRESENT—Messrs. Sinclair (chair), Whillas, MacFarlane, Halls, and Sage (Hon. Sec.).

WHEAT-FARMING—Mr. Halls in speaking of farming in this district, said he would not plough more than : in. deep in light land. He would then cultivate thoroughly, drill, and harrow twice. On ploughing the second time he would, if possible, go an inch deeper. After the second crop he recommended putting the land out to grass for two years, keeping it fed off with sheep; then fallow in the winter, cultivate in the spring, and leave as bare fallow. At seeding time he would again cultivate well before drilling, and harrow again after. Sow late wheats first, and later in the season the quicker-maturing varieties. Wheats which had given him the best results were Marshall's No. 3, Federation, Newman's Early; 50lbs. of seed, with 75lbs. manure, had given the best results. A larger quantity of either seed or manure resulted in a smaller yield. Mr. MacFarlane sowed 1bush. of seed and $\frac{1}{4}$ ewt. of manure, as with lesser quantities the crop was not thick enough. Messrs. Whillas and Sinclair sowed a good quantity of seed and different quantities of manure at various times. The Hon. Secretary agreed with Mr. Halls that there was nothing to be gained by using more than about 70lbs. to 75lbs. of super. During the past two years, however, he had used Kangaroo brand guano, and the more he put on the better the crop. He thought it would pay, both in the crop and for the feed afterwards, to use 3ewts. of it. Mr. Halls, in reply to questions, said he believed in good cultivation, and that it paid to crop a limited area and work it well. He had averaged 11 $\frac{1}{2}$ bush. for the past four years.

PHOSPHORIC ACID AND IRON.—Members wished to know whether phosphoric acid in a water-soluble manure coming into combination with iron in the soil would be lost as a plant food. [If iron combines with phosphoric acid it will form an insoluble phosphate, and will only be lost in the sense that it becomes insoluble in water, and, therefore, unavailable for the use of the crop. Such combination would gradually be broken up and once more reduced to a water-soluble condition.—Ed.]

Koppio, September 23.

(Average annual rainfall, 17in.)

PRESENT—Messrs. Price (chair), G. B., M., and F. Gardiner, G. and M. Howard, Brennand, Newell, F. and R. Richardson (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Gardiner. A crop of kale was much admired. Mr. Gardiner had taken an enormous amount of green feed off this crop, and advised others to try kale as a summer fodder. The crops generally looked strong and healthy—particularly a paddock sown early in May with Federation, on land which was fallowed early the previous year, sown with rape and feed off with sheep. A portion of this plot was sown with 2ewts. seed to the acre; but there was no apparent difference between that part of the crop and the part sown with 1ewt. per acre. A number of different brands of manure were used on plots side by side, but no difference was apparent in the results up to the present. Mr. and Mrs. Gardiner entertained members at tea, and were suitably thanked. The Chairman gave a short account of the Congress meetings.

Penong, October 9.

(Average annual rainfall, 12½in.)

PRESENT—Messrs. Shipard (chair), Bennier, Kalmar, Lovell, Kreig, Olsen, J. B. and J. Oats (Hon. Sec.) and one visitor.

BREEDING AND KEEPING PIGS.—Mr. Olsen read a paper on this subject. He considered that pig-keeping in connection with farming would only pay if the pig was treated as a grazing animal. Two paddocks, of convenient size, should be fenced off with barbed wire or pig-netting, ploughed early and sown with barley and rape. This would come up with the first rains, and would continue to grow till the end of the year. The race from the sty should be arranged so that the pigs could be turned into either paddock at will to feed off the crop. At the end of August he would close one paddock to allow the feed to ripen, and the pigs could be turned into it again for the summer. He considered this to be the natural way to keep pigs, and that they would be healthier and do better in every way than if kept in sties all the time. He recommended breeding from any good, roomy, lengthy sow with a Berkshire boar. Within limits, the older the sow was the harder the litter would be. It was quite a mistake to breed from young sows. For a month or five weeks after weaning great attention should be paid to the needs of the young pigs. They should have clean sties, with straw for bedding, and a regular food supply. Mr. Bennier and the Hon. Secretary agreed that pigs could be kept with less trouble and would return greater profit if kept in small paddocks, as advocated in the paper. The chairman thought it better to keep them in a sty or yard. If allowed to roam at large they were a constant source of annoyance.

SCARCITY OF FARM LABORERS—Members were of opinion that there was plenty of work in the immediate neighborhood for farm hands for the harvest. There was also a large demand for scrub-cutters during the winter months. Hundreds of acres of scrub were left standing because suitable labor could not be obtained.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Forster, September 25.

(Average annual rainfall, 16½in.)

PRESENT—Messrs. J. Searle (chair), Luxcom, Hayman, W. Searle, Payne, Towill, Helbig, Sears (Hon. Sec.), and one visitor.

HORSE-BREEDING.—The Hon. Secretary read a paper on horse-breeding. It was necessary to select mares as pure bred as possible. He preferred the Clydesdale, and would mate them either to the same breed or a Suffolk Punch. The stallion should also be as pure bred as

possible. Pure-bred mares would always sell well, and bring twice as much as a mongrel. He would breed as early as possible one year, fairly late the next, and then give the mares a spell the third year. This would give the mares a chance to get a little life in them and lose their "pddy" look, and they would not look aged so quickly. Another good horse for sale could be bred by mating these mares with a well-bred blood stallion. This would produce a first-class roadster, a class of animal much in demand by the Indian buyers. He advised members not to breed from the progeny of either crossbreds mentioned. In the discussion which followed Mr. Payne recommended breeding the Clydesdale, as they sold so well. Mr. Towill favored the Suffolk Punch on account of its being more active.

MARKETING FARM PRODUCE.—Mr. Payne considered that more attention should be paid to the marketing of produce. He believed that produce handled by the Government Depôt received greater care than other produce. Members thought that egg circles should be formed in this district; and also that it would pay farmers to combine to make up a large parcel of wheat and send samples to merchants to procure quotations.

Geranium, August 28.

PRESENT.—Messrs. M. Alford (chair), O'Loughlin, Cochrane, W. and W. J. Mitchell, W. and J. J. Watkins, Sheridan, Leahy, Hammond, Wendelborn, Foreman, F. S. Alford, Weidenhofer, Cooney (Hon Sec.), and five visitors,

PREPARATION OF SOIL.—Mr. F. S. Alford read a paper on this subject to the following effect:—The successful farmer of to-day was essentially a business man engaged in an occupation that required to be conducted on scientific lines. It was not enough to simply grow crops, but they must be so produced as to yield a profit on the capital invested. To succeed he must be thoroughly acquainted with every detail of farming, and possess an intelligent knowledge of the principles upon which the art of agriculture was founded. It was most important that the farmer should understand the nature and condition of the soil, particularly if it was of poor quality in its natural state. Analysis showed that the local soils were deficient in three elements of plant food, viz.—nitrogen, potash, and phosphoric acid. Potash was a plant food that had not received the attention it merited, and it was a matter for wonder that its use in the form of muriate of potash was not tried in this district. It was noticeable that where ashes were spread by a scrub burn the crops grew luxuriantly. It had come under his notice that where potash had been applied in addition to superphosphate in similar country to this the yield had been increased by 25 per cent. Phosphoric acid was the most important plant food to consider in South Australia, and the larger the quantity of super. put on the stronger the plant would grow. [In districts with a very light rainfall it would be a great mistake to put on very heavy applications of superphosphate, as the growth would be forced to such an extent that the moisture would all be taken from the soil when the crop was only partly grown. The quantity of superphosphate needed in each particular district to give the best return can only be proved by experimenting, and this should be done by all farmers. Small plots can be tried with different quantities of manure. Results should be carefully weighed and recorded. It will then be seen if an increased yield results, whether it is sufficient to justify the extra expenditure.—ED.] Nobody doubted the wisdom of thorough tillage, although opinions might differ as to the best method. Fallowing early and working the soil down to a fine tilth was very advisable in this district. Weeds were destroyed and moisture conserved for future use. Too much attention could not be paid to the preparation of a good seed bed. The finer the bed was the better the grain germinated. The roots spread and multiplied and the growth was more rapid and even. The amount of water required by a crop of wheat was approximately 350 tons per acre, equivalent to nearly 4in. of rain. As this was in addition to the water lost by evaporation, surface drainage, &c., the necessity for a good rainfall and the importance of conserving it in the soil was apparent. The natural conditions that obtained locally were more suited to profitable cultivation than was generally believed. The two important factors were the use of fertilisers and good tillage. Thorough cultivation would not make up for any deficiency in fertilisers; nor would fertilisers alone make up for cultivation. Only a portion of the gross returns of a fair crop was net profit, so that an increase in yield above that point would soon double the profit. An eight-bushel crop might give a net profit of 10s. per acre. If by spending 2s. 6d. per acre more on superphosphate the return was 12bush. for the same labor, there was more than double the profit.

In the discussion which followed it was pointed out that, while it was not always an easy matter to put the most scientific methods into practice, fallow land in this district would pay well for the extra labor and attention involved.

Geranium, September 25.

PRESENT.—Messrs. M. Alford (chair), Cochrane, Foreman, Hammond, Mitchell, Weidin-hofer, Wendelborn, Sheridan, Watkins, F. S. Alford (Act. Hon. Sec.), and three visitors.

LICENSING OF STALLIONS.—The Chairman introduced a discussion on Sir Lancelot Stirling's paper on licensing of stallions, read at the Adelaide Congress. Members unanimously agreed that, in the interests of the horse-breeding industry, veterinary examination of stallions should be obligatory, and all unfit and unsound animals condemned or refused a certificate.

Lameroo, September 25.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. F. W. Eime (chair), C. R. Eime, Wittwer, Dunstone, Leckie, Mead, Ross, Wray, W. J. and S. G. Troubridge, Hannan, Gibbon, Walsh, Skinner, Koch (Hon. Sec.), and six visitors.

ROSEWORTHY COLLEGE.—Mr. Walsh, after reporting on the Congress, spoke of his trip to Roseworthy College. He recommended every farmer to visit the Agricultural College and Farm if possible. The housing of the poultry, breeding, feeding, and other statistical information were all items worth seeing and knowing, while the practical side could also be seen and explained. He also inspected the orchard, vineyard, and crops. The visit was an object lesson which he would not soon forget.

DOG-PROOF FENCES.—The following paper was read by the Hon. Secretary :—"The wild dog, although much less troublesome than he was when there was less cleared land, will soon be a nuisance to those farmers whose land is fast becoming fit for carrying sheep. Continual watching and yarding at night becomes monotonous, and debars many a farmer from keeping a few ration sheep and breeding ewes. The capabilities of this district to carry sheep in the near future will not be denied. Our trouble will then be dogs, not the many, but just the stray one or two that will come from the unsurveyed country north of here, and harass the small flocks. The Bordertown people are complaining of the ravages made at times by wild dogs, and they suggest a dog-proof fence to run parallel with the Pinnaroo railway line. If such a fence were started from the Victorian boundary, north of Pinnaroo, and taken to a point on the River Murray, north of Tailem Bend, it would serve as a barrier to dogs moving southwards. This project, if sanctioned by the Government, would cost approximately £100 per mile, or for the 90 miles of fence, with contingencies added, about £10,000. To find the interest would be our part, and at $4\frac{1}{2}$ per cent. would be £450 per annum. Constant attention would be necessary, and the services of an expert trapper, who could combine the two duties, at about £150 per annum. Allowing £50 for extras, scalps, &c., the annual expenditure would be £600. A vermin rate of 8d. in the pound on our present district council assessment would cover all expenses. To average the carrying capacity of the land at 50 sheep per 1,000 acres, is on the safe side, but it would give a total of about 35,000 sheep in the district. The clip, taken at 6lb. per sheep, would yield 93½ tons of wool. This at Port Adelaide should be worth 4d. per lb., or a total of £5,200. We should be able to export quite 4,000 lambs yearly, at 7s. 4d. per head, giving us another £1,500. This all means business in the way of railway freights, woolpacks, shearing, etc. I do not think that this would all come to pass as soon as we had the fence erected, but we must remember that Government sanction takes a lot of getting, and as yet we have not even asked for the fence. In the meantime we can be preparing and improving our land. We must, however, work together to get other recognised local bodies interested." Members did not feel that they could support this proposal. They considered that a fence in the north would be useless without a similar one in the south.

FIELD TRIAL.—The Hon. Secretary reported on a field trial recently held, and all agreed that it was most satisfactory.

Parrakie, September 25.

PRESENT.—Messrs. McGuire (chair), Short, Diener, Schmidt, Lecor, F. C. and O. Heinzel, Wittwer, Neindorf, Beelitz, Morrison, J. and F. J. Dayman, Ferne, Threadgold, C. Burton, Willis, and J. Burton (Hon. Sec.).

FOLLOWING.—Mr. Beelitz read a paper on farming in this district. He recommended having as much fallow as possible, as, in his opinion, twice the crop could be grown on fallow that could be raised on stubble land. Working with fallowed land therefore saved seed, manure, and labor. He would plough as soon as seeding was finished, and work it up with the cultivator before harvest to kill all the weeds. A good burn could be obtained with the stubble grown on fallowed land, and this would do a good deal towards getting the shoots down and

killing the stumps. On fallow land a good crop of hay could be grown, thus saving the chaff bill, and keeping out the many weeds which were now being brought with the chaff. Members generally agreed with the views of the writer.

MELILOTUS PARVIFLORA.—Mr. Diener tabled a sample of *mellilotus*, 2ft. 6in. high, grown with stable manure. It was sown in April. It was considered to be a good fodder plant for this district.

Renmark, September 30.

(Average annual rainfall, 11in.)

PRESENT.—Messrs. Muspratt (chair), Huggins, Nuthall, De Witte, Wilkinson, Taylor, Cole (Hon. Sec.), and one visitor.

CITRUS FUMIGATION. Some members thought it would be a good thing for the Packing Union to maintain a fumigating outfit for hiring out, but it was pointed out by others that the work of fumigation required special knowledge, and was best done by someone who made a business of it. It was agreed that citrus trees were greatly benefited by fumigation, properly done. Members were favorable to a suggestion that the orange-growers should be got together and an estimate made of the number of trees that could be reckoned on in a contract for fumigation.

OIDIUM TUCKERI.—A letter from Mr. Lowcay, vineyard inspector under the Phylloxera Board, recommended similar winter treatment of vines for oidium as for anthracnose and summer sulphuring. The vines should be sprinkled with the best quality sulphur, preferably with a bellows; first application to be made when the young shoots are about 4in. long; second, when the vines show sign of flowering, or a day or two before (sulphur assisting to set the fruit); and finally, when the berries are about the size of a pea. The sulphur should be applied on a warm, calm and dry morning—never when the vines are wet with dew.

FROST SMUDGES.—Circulars were tabled descriptive of a smoke-producing machine, the mechanism of which was explained by the secretary, Mr. Cole. Members were inclined to be sceptical of the value of smudge fires for frost. Mr. Smith said that Mildura experience had shown that they were good for up to five or six degrees of frost, but were apparently useless for anything beyond this.

ORANGE GRADING AND MARKETING.—Mr. Cole described the working of an apple or orange grader which he had seen at work at the Adelaide show. Members said that there was formerly an orange grader in the Packing Union, but that it had been a failure in practice. Mr. Smith reported that he was now using the union grader at Olivewood. The machine had been wrongly set while in the union shed. He had altered the spirals to run out, and found that it did very good work with lemons; oranges were best graded by hand when the girls were used to the work. Members considered the cases now in use for oranges not at all suitable for packing properly graded fruit in. The export case, as used in Renmark, was bad enough, and the Victorian imperial bushel case, as used in Mildura, was worse. Mr. Muspratt considered that the Californian orange case (12 x 12 x 24, with a division) was of the right dimensions for its purpose. In reference to reputed complaints from city dealers in Renmark oranges, members agreed generally that there was room for improvement in the grading of the fruit. One grower, it was said, had sent his oranges away in cases that smelt of kerosene. It had been a bad season for the keeping qualities of fruit. With reference to complaints of thick-skinned fruits and suggestions that the fault was due to over-manuring or the improper use of manures, members were of opinion that in most cases the coarse-skinned fruit had come from young trees or trees newly budded on to lemons. Mr. Muspratt related that the oranges from one of his budded trees would only go 27 to the case.

Waikerie, September 27.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Rowe (chair), Rogers, Burton, Borroughs, Lewis, Jones, Emmett, Green (Hon. Sec.), and three visitors.

WHEAT LAND.—A discussion took place as to the best mallee land for wheat. Mr. Borroughs considered that land where white mallee not less than 3ins. in diameter was found would be best. The lighter sandy soils would be the best to cultivate in the dry seasons, when the rainfall was not more than 5in. or 6in. The white mallee flats should be left in fallow the first year, and the whip stick mallee land should not be cropped until it was well worked. The best wheats for the district he considered to be Early Para, Steinwedel, Clubhead, Spring Allora, and Rattling Jack. Federation, he thought, would not do well in the dry seasons. Mr. Jones considered porcupine land of little use unless it was manured from the start. All mallee land should be cross-disced. Mr. Lewis had not found new mallee land much good until it was scarified. Members thought Purple Straw and Gluyas wheats less subject to rust than the varieties named above.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, September 28.

(Average annual rainfall, 33in.)

PRESENT—Messrs. A. Jacobs (chair), T. Jacobs, C. and J. Lewis, J. and G. Brumby, Chapman, Broadbent, Hicks, Stone, Strange, and Curnow (Hon. Sec.).

APPLES FOR EXPORT.—Mr. Chapman read a paper on this subject as follows:—“In South Australia apples can be grown equal in quality to those produced in any part of the Commonwealth. In this and the adjoining States thousands of bushels more are grown than are needed for local requirements; and it becomes more than ever apparent that, with the hundreds of acres of young trees that have been planted during the last few years coming into bearing, it is to the export trade that the apple-grower must look in the future for a market. The most important thing to consider in connection with the export trade is the kinds of apples most suitable for the oversea markets. For the English market I would name the following:—Jonathan and Cleopatra are at present the popular fancy, and can be relied upon to realise good prices, if anything will. Dunn’s Seedling (known in the other States as Munro’s Favourite) is a popular variety with the English buyer, but owing to splitting badly it is not now in favor with growers in this district. Orange Pippin is a variety that can be got away early, and generally sells well, and is recommended by the Government Commercial Agent. The Rome Beauty is a grand showy apple that can be grown to perfection in this district, but is rather late in ripening to make it an ideal export apple, as it is generally the earlier shipments that bring the fancy prices. Owing to the fact that it carries so well and always arrives in such splendid condition, I include it among the first five. We are all aware that there are many other splendid varieties, but the above-named seem to be popular with the English buyers, and it is useless to try to thrust a lot of varieties on the home market just because we like them. For the German market, the varieties mentioned are equally suitable; but the German buyers do not seem quite so conservative in sticking to the old varieties. Last year I forwarded to Germany a small consignment of Reinettes, a variety that I had never done much good with in London, and they sold very well indeed. During the last two years there have been small consignments sent to France. The varieties recommended for this trade are London Pippin, Dunn’s Seedling, and Reinette du Canada. For the English and German markets apples from $2\frac{1}{2}$ in. to 3in. in diameter are better than the larger fruit. The importance of grading is always impressed upon us by the men at the other end as being an all-important factor. Personally if buying a case of apples I should certainly prefer a small apple now and again to a handful of woodwool. However, the buyers think otherwise, and the practice of filling in a corner now and again with a smaller apple is strictly prohibited. The plan often adopted for grading is to have a piece of thin board, or stiff cardboard, with holes cut in to the different grades, say $2\frac{1}{2}$ in., $2\frac{3}{4}$ in., and 3in. diameter, and try any apples you are doubtful about. After going through a bushel or two it will be unnecessary to refer to the gauge very often. In grading and wrapping the fruit care must be taken not to bruise or injure it, and each apple should be placed firmly in the case, building the layers as evenly as possible. The cases should be packed as full of fruit as it is possible to get them without sacrificing the grade.” A good general discussion followed, in which the majority of members agreed with the writer. Mr. Chapman stated later that apples grown with the natural rainfall carried better than those that were irrigated.

Clarendon, September 27.

(Average annual rainfall, 33 $\frac{1}{2}$ in.)

PRESENT—Messrs. White (chair), H. C., E., and A. A. Harper, J. and P. Pigott, Shiedow, Brooks, Phelps (Hon. Sec.), and two visitors.

HOW TO STOP LAND WASHING.—Mr. A. A. Harper read a paper on this subject. The reasons why the hilly country was washed away were as follows:—1. Having uncultivated land above that which is cultivated without drains to carry away the surplus water. 2. Trying to get the land as level as possible for the machinery at harvest time; that is to say, ploughing it in two or three chain lands and working the furrows all in. Working the land with scarifier or cultivator only was a bad plan, as it cut it into dust, and when it was full of water it easily washed away. A good many farmers worked their land at the bottom of the paddock. This was a great mistake. There were paddocks in this district that had been worked in this way, and they were washed about so badly it would be difficult to take the crop off. Harrowing the land up and down the hill with heavy harrows, leaving big marks for the water to follow, was a bad practice. To prevent this washing of land he would in the first place have a drain large enough along the top of paddock to take away all flood water. It must of course always be kept open. A little time spent in this way occasionally saved a lot of soil. It would be better not to study the machinery quite so much and work the ground in smaller lands, say, not more

than 1 chain wide, opening all the furrows. That would prevent a large body of water from coming down in one place, overflowing and washing across to the bottom. He would recommend always ploughing the land, and then, if necessary, scaring it, to give it more depth to take in the water. It was wise to commence to plough at the top of the paddock to avoid any wash if heavy rains should come before the ploughing was finished. In harrowing he would always try to work across the hill; the lighter the harrows were the better, provided the seed was covered." The paper was well discussed. Some members advocated ploughing smaller lands with more furrows, but if the land lay in different grades and slopes it was of no advantage. The general expressions of opinion were in favor of the views set forth in the paper.

Kingscote, October 4.

(Average annual rainfall, 18 $\frac{1}{2}$ in.)

PRESENT—Messrs. Turner (chair), Neave, Castine, Wallace, Fitzlaff, Mitchell, Nash, Wright, Jacka, Bell, Cook (Hon. Sec.), and two visitors

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Bell. In the morning a very promising hay crop, estimated to go over 1 $\frac{1}{2}$ tons, was inspected. This land had been cropped for four successive years. A large portion of the land had ironstone nodules in it, but was far superior to the general ironstone country, most of it being dark loamy clay on basalt rock. A trial of rye grass and red clover was being made on land covered with eucalyptus shoots, but it looked a failure. After dinner a paddock of Baroota Wonder wheat was inspected. It looked healthy, but very thin. A crop of Bucks Barley was, in the opinion of the owner, the best crop seen on that kind of land. A grass plot in which the seed had been drilled in looked splendid. Members agreed that this was a good way to plant grass. In the garden many vegetables were flourishing, and also a plot of *Phalaris commutata* about 4ft. high. This had been cut twice this season.

Longwood, October 2.

(Average annual rainfall, 37in.)

PRESENT—Messrs. W. Nicholls (chair), J. Nicholls, Roebuck, Coles, Pritchard, Oinn, Furniss, Glyde, Hughes (Hon. Sec.), and one visitor.

MANURING OF FRUIT TREES.—Mr. Curnow's paper on this subject (see page 331) was read and discussed. Members emphasised the necessity for returning humus to the orchard soil in the form of stable or green manure turned in.

FERTILISATION OF FRUIT TREES.—Members differed in opinion as to the extent to which fertilisation of fruit blossoms was accomplished through the agency of bees. Some considered that they had very little to do with it.

Meadows, October 4.

(Average annual rainfall, 34 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Ellis (chair), Brooks, Catt, Griggs, Warren, Smith, Nicolle, Bertram, Morris, and Morphett (Hon. Sec.).

REARING CALVES—Mr. Warren read the following paper on this subject:—"Dairymen, as a rule, dispose of their calves as soon as possible after birth, either by killing them themselves or disposing of them to some person who makes 'veal.' This method of such early disposal does not give the owner any opportunity of selecting promising heifers to keep up his dairy herd, which would have been possible had he kept his calves for a time and observed their development. It is a wise calf that knows its own mother, but it is a wiser farmer who prevents the calf from attaining this knowledge by the substitution of some method of artificial feeding. I am speaking here of the general run of cattle only reared for grazing purposes or for use in the dairy. It may be safely stated that it is the treatment and feeding of a calf during the first six months of its existence which make or mar it from a profitable point of view. A calf once starved or badly treated never recovers fully, whereas one that has received proper attention in its early stages, though forced to rough it at some future time, will always pick up condition quickly when it is given a chance. What breeder of horses is there who does not recognise the absolute necessity of feeding his foals well if they are to grow into horses of size and bone? 'Stint the foal and you stunt the horse' applies with equal force to cattle, but the

most casual inspection of the ordinary farms will make it wofully apparent that this highly important principle is honored more in the breach than in the observance. Over and over again, while attending markets of store cattle, have we been forced to agree with the remark with which we have been greeted by others, 'There is nothing here worth buying.' Does the fault lie entirely in the breeding? I am convinced that it does not. Many an animal has been labelled 'under-bred' when under-fed (while a calf) would be very much nearer the mark. It is, however, one thing to diagnose a disease, but quite another to find a remedy. I would suggest that the answer may be found in the intelligent use of the artificial feeder—the intelligent use, mark this—not the happy-go-lucky rule-of-thumb use, which can only tend to disaster, and which is a disgrace to the user, a cruelty to the calf, and an injustice to the maker of the calf meal and the feeder. We naturally feel that no system can be of material value that does not embody the two essential points, economy and simplicity—economy because the margin of profit is small, and simplicity because of the fact that we are all liable to errors, and to reduce the opportunity for errors is to reduce the number of errors. I am of opinion that the most simple way of feeding is to have your calves, as many of them as is convenient, kept in one shed. At the appointed time you multiply the quantity which you presume the average calf will drink by the number of calves kept. Having arrived thus at the total quantity required, you mix it and pour it into the wooden trough in the shed, and the thing is done, and your duties are over till next feeding time. This is surely simplicity itself. There are the calves, and there is their meals. Theoretically, the system appears to be a sound one, and there are plenty of people who imagine it to be really so. But how does it appear when viewed from a practical point of view? It is evident, if the plan is to succeed, that each calf must be identically similar to every other calf as regards physique, constitution, and appetite. Each animal must be capable of drinking at the same pace and of digesting an equal amount of food at each meal as its companion; otherwise it is obvious that the slow drinkers will be starved, the glutton gorged, the strong bully will take his weaker brother's share, with the inevitable result of disease and disappointment. Unfortunately, however, calves are not machines. Each one possesses its own individuality, and this being so, surely it is courting disaster to treat all the calves as though they were made in the same mould. But there are other points in this, one of which may be called wholesale feeding. This is a practice that cannot be approved of. The wooden trough is in itself a source of danger, since it is always liable to sourness unless scalded between each meal. And how often is this done? But another evil lies in the danger of infection from one calf to another. If one of the animals has a cold, or is suffering from any affection of the nostrils, mouth, or mucous membrane, there is every possibility of the others catching the disease while feeding from the one vessel before the attendant has discovered it. One cannot, however, be blind to the fact that it is entirely contrary to the nature of the offspring of any mammal to obtain its nourishment during its early infancy by gulping its food in large quantities at a time. The plan that has been adopted, and after trials found to be satisfactory, is as follows:—Have a special feeding shed, where calves are only allowed at the actual time of feeding. The shed would be about 6ft. wide, divided into stalls, each capable of holding one calf. In each stall there should be a feeder or bucket hung on a bracket, and the milk is sucked up through an india-rubber pipe and teat. In this way the amount and ingredients of each pail may be calculated so as to exactly suit the particular calf which it is desired to feed from it. The calves should be fed for two or three days from milk only, and then gruel made of calf meal and water is very gradually introduced, so that the change from pure milk to simple gruel is practically imperceptible. One of the most important things in this system of feeding is the careful cleaning of the rubber tube and teat. It is essential that this should be done after each meal with cold water. Hot water should not be used, as it causes the rubber to become rotten. If the washing be properly done and the pails scalded, &c., the calf-rearer may feel satisfied that up to a certain point he is on the road to success. But there are other details the non-observance of which will lead to danger. Under no circumstances must the gruel be anything but fresh when fed to the calves. Many a failure could be attributed to the attendant who, in order to save himself trouble, may mix enough gruel to last for two or three meals. This practice must be put down with a hand of iron. One of the principal evils to be combated is indigestion, the result of which is commonly known as 'pot belly.' The causes may be roughly placed under three heads, viz., hasty feeding, over-feeding, and injudicious feeding. Now, with the artificial feeder it is quite impossible for a calf to bolt its gruel; it can only be obtained in a thin stream as it would be if it were milk obtained by natural means from the cow. It is impossible for over-feeding to occur except by the ignorance or incapacity of the attendant. A calf can only take what is put into its pail, and has no means of securing any part of another calf's meal. The first two causes of indigestion occur where calves are fed from troughs, though it may occur where the calves are fed separately from buckets, as a greedy calf will swallow its meal far too quickly for its health. It is from the third cause, 'injudicious feeding,' that nine-tenths of the digestive troubles occur. By this I do not mean the act of giving actually unwholesome food, but the too rapid change from one food to another. The change from gruel to solid food should be just as gradual as from milk to gruel, and the longer a calf is kept on gruel the better will it thrive. By all means encourage a calf to eat as soon as possible, but not

with the idea of substituting solid for liquid food at the earliest date. Nothing is so conducive to a state of 'pot belly' as a sudden change from the latter to the former food. There is an argument in favor of feeding with calf meal. If you are feeding with milk you are often at the mercy of the weather as regards the supply; and a sudden shortage of milk means that the calves have to be fed on more solid food, and indigestion is the result. The meal, on the other hand, cannot run short, and this gives the user of it relief, at any rate, from one of the anxieties attendant upon calf-rearing. Farmers can obtain supplies of calf food in Adelaide at the following prices:—21s. per hundredweight; 11s. per $\frac{1}{2}$ cwt.; and 6s. per $\frac{1}{4}$ cwt.; and the prices work out at about three feeds for one penny. The calf-feeders, with rubber teats fixed to the tube, are 3s. 6d. each, and this tube is put into an ordinary bucket, and it is not necessary to go to the expense of having a special pail. I am positive that if more farmers would give the feeding a fair trial there would not be such a 'slaughtering of the innocents' as has been the case in the past. If more care were taken in the feeding of calves, intended eventually to be drafted into the dairy herd, we should have a more uniform type of dairy cattle than we have at present."

Port Elliot, September 25.

(Average annual rainfall, 20 $\frac{1}{2}$ in.)

PRESENT—Messrs. Welch (chair), McLeod, Chibnall, Barton, Pannel, Vince, Green, and Hargreaves (Hon. Sec.).

EXAMINATION OF STALLIONS.—Some discussion on this subject took place. Mr. H. B. Welch contended that arrangements should be made to examine stallions before they enter the show ring and not at the show.

FRUIT-GROWING.—In reply to inquiry, Mr. Green said that before putting in a fruit tree in the place of one that had been removed he would burn some rubbish in the hole. Members wished to know cause of nectarines dropping from the trees within a fortnight of ripening time. [It is not possible to give a definite reply, as some local condition is probably responsible.—Ed.]

STOCK COMPLAINTS.—A member reported that a mare had gone 25 days past foaling time, but the foal appeared to be alive. She was heavy in foal, but very sluggish, though apparently not in any pain. Another member wished to know cure for long white-pointed worms in horses. [Give 1oz. turps in 1 pint of raw linseed oil for these worms. In regard to mare the veterinary reports:—"Mares sometimes go about a month over the time, so 25 days is not unusual. When nearing foaling time a mare becomes sluggish and lies down a good deal, so the symptoms described are quite in order. The owner should look for the appearance of waxy matter on the teats, and if the 'time' has been correctly noted the mare should be carefully watched and tended."—Ed.]

SOUTH-EAST DISTRICT.

Keith, October 6.

PRESENT—Messrs. Lock (chair), Mott, Morecom, S., W. A., and P. A. Crouch, Kennett, McLean, Goodhard, Camp, Usher, Godley, Leishman, Schultz, Draper (Hon. Sec.), and five visitors.

HARROWING GROWING CROPS.—The Hon. Secretary read a paper on this subject, in which he explained that, while plenty of rain fell in this district during the winter months, it was necessary later in the season to break the surface of the soil to retard evaporation, or the crop would eventually suffer from lack of moisture. The best time to harrow the growing crop was, in his opinion, a few days after rain, before the surface of the soil set hard. The crop must be sufficiently advanced to have a good hold on the soil or more harm than good would be done by the harrowing. Disc harrows had been used, but he did not recommend them for this purpose. A good set of ordinary harrows was best. They should not be old and worn out, but if just out of the shop the sharp edges should be filed off lightly. Care was necessary to ensure that the teeth did not run sideways, as they would if much worn at the joints. Given a good set of harrows and a fair amount of judgment a farmer need not be afraid of hurting the crop in any way. A lot of weeds which would otherwise be taking food and moisture would be killed.

SHEEPWEED AND SORREL.—A discussion took place as to the best method of destroying these two weeds. It was considered for the former the best plan was to fallow two years in succession and work the land during the summer. For the latter members recommended feeding off with sheep.

Millicent, October 12.

(Average annual rainfall, 28½in.)

PRESENT—Messrs. Stewart (chair), Harris, Hart, Holzgrefe, Magor, Mullins, Williams, Oberlander, and Thompson (Hon. Sec.).

SHOTHOLE FUNGUS.—Mr. Stewart reported that he had great success in dealing with this fungus in peach trees by using, as a spray, Cooper's powder sheepdip at the rate of ½oz. to 1 gall. of water.

WOOLLY APHIS ON APPLE TREES.—In answer to a question in regard to woolly aphis, Mr. Hart said that kerosene emulsion was the best remedy he had used for aphis on peach trees. Tobacco water on the roots and trunks of the trees was very effective in sandy soils, but of less value on clay soils. [The treatment recommended by the Horticultural Instructor for the woolly blight on apple trees is as follows:—“Spray the patches of blight with tobacco and soap-wash, crude petroleum or red oil emulsion, or resin compound. Hold the nozzle close to the affected patches and drive the spray with great force. In small gardens these washes may be rubbed in with a paint brush.—*Ed.*].

TRIFOLEUM SUBTERRANEUM.—Mr. Oberlander tabled a fine sample of this plant. Other members had not been fortunate with it. The heat of last summer seemed to kill the seed.

FOX DESTRUCTION.—In considering the question of fox destruction members were agreed that, while the present high price of skins prevailed, there was sufficient incentive to ensure destruction without offering any bonus.

DRAINAGE OF SOUTH-EASTERN LANDS.—Mr. Holzgrefe read a paper on the drainage question, a summary of which is given below:—“This is a subject of the utmost importance to every landholder in the lower South-East, from Lake Bonney to the Coorong. Some of the first drains constructed, which are at present under the control of the district councils of Tantanoola, Millicent, and Mount Muirhead, have done good work in reclaiming and improving a lot of land which under natural conditions would have been useless. No doubt mistakes have been made; yet, taking the district scheme at a whole, an immense amount of good has been done by the drains. We must not overlook the fact that the 377 miles of channeling in the drainage area absorbed approximately £250,000. The land would have been of little value had that money not been expended on drains, and now that we have such a scheme we should do our utmost to keep the drains in good working order. But are they kept in good order? Some of them are filled with all kinds of rubbish—mud, tussocks and cut grass, weeds, and similar vegetation, and ti-trees so high that they can be seen in the drains a mile away. At one time it was possible to go from my home to Millicent by boat, along drain 36. Last winter an attempt was made to negotiate the journey, but it was impracticable. If the sides and bottom of every drain were kept clean much more water would be carried away, although the fall in some cases is not as good as it might be. Then, again, some of the bridges and culverts are neither high nor wide enough where the drains run bankers. The stone abutments for bridges and culverts are an improvement, but plenty of room should be left to allow the flood waters to pass beneath them. In some places one sees fencing and wire netting across the drains, enclosing watering approaches for stock. These help to block the proper flow of the water in flood seasons, especially when loose watercress and other rubbish is coming down. Another mistake is often made when cleaning out the drains; the mud and debris being placed too near the edge, and even plastered along the slopes, whence the wind and rain soon dislodges it, and leaves the drains just as clogged as if no cleaning had been done. Every landholder whose property adjoins a main or subsidiary drain should interest himself in the direction of keeping the channels clear. He should refrain from putting in any obstruction to interfere with the flow of water, and should guard them against damage by his stock when the grade is steep. Of course, small stock will not do much damage on a drain bank graded one in one. Dams are another source of trouble in the drains. My firm opinion is that dams should not be put in the drains. Since the early times vast improvements have been made in the construction of windmills and tanks, and in the methods of putting down a bore for water instead of sinking a well. The cost of ensuring a permanent supply of water for stock is only about half of what it was 25 years ago, and it is in reach of most farmers to have small irrigation plants of their own. The most important phase of the drainage question, so far as we are concerned, relates to the cleaning of the channels. In this age of advancement and perfection in all classes of machinery it is high time that our present shovel and rake methods were discarded, and some more modern system adopted in the cleaning of the large main drains.”

Mount Gambier, October 9.

(Average annual rainfall, 31½in.)

PRESENT.—Messrs. Sassanowsky (chair), Wedd, Watson, Edwards, Major, Holding, Cobblewick, Engelbrecht, Niquet, Kennedy, Ruwoldt, Innes, Holloway, Pritchard, Body, Buck, Kilsby, Pick, G. and D. Collins (Hon. Sec.).

TRIP ON THE MURRAY.—Mr. Collins read an interesting paper on the trip up the River Murray which the members of the Bureau took at show time. For that trip they were indebted to the chairman of the Mount Gambier Branch, for he had arranged with Mr. McIntosh, of the Government reclamation works.

Penola, October 6.

(Average annual rainfall, 26½in.)

PRESENT—Messrs. Strong (chair), Ockley, Pinches, McKay, Darwent, Miller, Williams, Fullarton, Maxwell, Warner, McDonald, Richardson, Adamson (Hon. Sec.), and a number of visitors.

SPYEYING AND DEHORNING OF COWS—This meeting was held at the homestead of Mr. I. T. Williams. Mr. Williams read a paper and gave a demonstration on speyeying. The paper was to the following effect:—Heifers from six months old and cows of any age may be operated upon; thus young heifers that are ill-shaped, or poor milkers, bad doers, or descendants of either can be treated, to save reproduction of these defects. On the large stations it is a general practice to cull and spey the heifers at one or one and a half years old, and the cast for aged breeding cows at nine or ten years, according to the numbers to be kept in the herd but any that do not please the owner as reproducers are operated upon as desired, irrespective of age. At any stage of gestation the operation may be performed, but it is always desirable, if possible, to do it six weeks after calving, as it is easier for the performer and more humane. Care should be taken not to wean the calves from any cows that may be suckling immediately after speyeying, but they should be allowed with their mothers for at least three weeks after. The beast to be operated upon is bailed, and fastened to a rail by flank and body ropes, and the legs drawn back with an ordinary leg rope. It is better not to tie the flank and body ropes, but to have an attendant to put a hitch round the rail, so that he can ease or tighten one or both, as required, because wild and sulky cattle sometimes get into positions that are not desirable. Cleanliness on the part of the operator is essential, and all knives, needles, and twine, also the stone that is used to sharpen the knives, must be subjected to a strong disinfectant. Carbolic acid is one of the best; failing this, Little's dip, one in fifty. When the hair is long remove it from where the incision is to be made, viz., in the flank. Then disinfect the part well with solution. Have the hands thoroughly clean; also disinfect them. Then make an incision through the hide only, about 4in. long, midway between the hip bone and last rib in the hollow of the flank. The hand must then be forced through the several layers of oblique muscles, until the white membrane (the peritoneum) is reached. This sometimes gives the novice some trouble. Some advise cutting it with a knife, but there is no need for that; one soon gets into the knack of putting the two forefingers through by turning them up towards the backbone as soon as the membrane is reached. When the abdominal cavity is reached locate the uterus, run the fingers along from the point towards the rectum, and the ovaries will be found one on either side, hanging from the uterus. With heifers it is quite safe to take ovaries off by drawing to view from the incision, and cutting off with an ordinary castrating knife; but with cows, in calf especially, it is better to use one of John Baker's special speyeying knives, which is to be inserted along the arm, and the ovaries severed inside, care being taken to come well down the fallopian tubes. Sometimes ovaries will shell when pressure is put upon them. This is no good; the operator must take them out clean. After the operation is performed disinfect the flesh wound (before stitching) with Little's dip or other solution; then stitch up the incision in the hide, using cross stitches, care being taken not to put the first one in too close to the bottom of the cut, so that any discharge may get away. After stitching smear well with Stockholm tar. Beasts that are to be operated upon should be yarded over night. After speyeying they require to be left quiet, and not put on to excessively rich feed for a few days. If properly performed, the death rate from speyeying is virtually nil. The dehorning was performed by Mr. Trater and Mr. McDonald, under the direction of Mr. Williams. Mr. H. Richardson said that, though no doubt a necessary part of station work, the operations did not appeal to him: they were too gruesome. Still, he recognised that they would not be done unless necessary. Mr. McKay said he was a great believer in both operations, and the workmanlike manner in which they were carried out that day reduced the necessary cruelty to a minimum. Mr. Williams admitted that the operations were gruesome, and he never started speyeying without feeling regret at the necessity. Still, once he started, he did not believe in dallying with the knife—the quicker the better—and he really thought that, after all, the first skin cut was the worst. The internal operation was not so painful as imagined. With regard

to dehorning, he believed that was crueler than speying, but it was necessary. For many years he would not do it, but after seeing cattle terribly gored in station yards and railway trucks, he came to the conclusion that it was much kinder to remove the horns when they were yearlings, as the punishment then was sudden, and over for all time, instead of the terrible sufferings that subsequent gorings often inflicted. If any of the members or visitors cared to try the operation of speying he would be only too pleased to go to their homes and assist them. A hearty vote of thanks to Mr. and Mrs. Williams for entertaining the guests closed the meeting.

Tatiara, September 25.

(Average annual rainfall, 19½ in.)

PRESENT--MESSRS. SAXON (chair), BOND, CAMPBELL, WILSON, STEER, KIRBY, FISHER, RESKE, O'SHEA, RESCHKE, DUNCAN, STAUDIE, STANTON, AND TRUMAN (Hon. Sec.).

EXPORT DUTY ON WHEAT.—Mr. Wilson read the following paper:—"It has not been shown that an export duty on wheat would have the effect looked for by the promoters of this scheme, but it would be an unjust penalisation for the grower. If a special tax were placed on the farmer he would probably turn his attention to wool or other sources of income from his land, and thus bring down the total production of wheat to a local requirements level. This would defeat the object in view, and land us back at the starting point. The best means of securing the desired result, and the fairest way, in my opinion, would be for the Government to mill the wheat into flour, and by this means fix the price for the article. I do not mean that the industry should be nationalised, but as the Government have established a butter factory, freezing works, &c., they would not be departing from their policy by establishing grist mills. This would compel the miller to be satisfied with a fair profit, and the result would simply be that the farmer would have the world as a market, and the consumer would get his loaf of bread as cheaply as possible." Mr. Reschke considered there should be no export duty, and wheat should go wherever wanted. Mr. Kirby thought the Government should erect flour mills and grist the wheat, thus keeping in the country the offal, such as bran and pollard, to the benefit of the farmer. It would mean a good price to the grower for his grain, and would ensure another industry which was now being given to another part of the world. If all requirements were manufactured in Australia things would be cheaper. Mr. Bond said that an export duty could not be established while they had an import duty of 1s. per centum. Mr. A. Fisher did not agree that the export duty would be the means of reducing the growth to merely local requirements. The tax would only be 1d. at most, and farmers would not stop for this. There were as many fat farmers in the State as there were millers. He favored nationalisation of the milling industry. Mr. Steer thought the struggling farmers on the repurchased estates who got the land for wheat-growing would suffer. They would have to turn to sheep, for which they would not have enough land. The States did not want the bran and pollard, and it would be dearer to export in three consignments instead of one. He did not find fault with the middlemen. They had to handle big bulks and take all risks, while the farmer wanted money; and if they made a profit he did not grudge it to them. Mr. Campbell was opposed to a duty, and thought State mills would have a good effect. The middleman got a little too much in comparison for the assistance he rendered. The Chairman spoke in a similar strain. They had an instance of State-managed industries in the Produce Export Department, and State grist mills, if worked on practical lines, would be of immense benefit.

THE JOURNAL

OF THE



Department of Agriculture

OF SOUTH AUSTRALIA.

No. 5.

DECEMBER, 1909.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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“The Editor, Journal of Agriculture, North Terrace, Adelaide.”

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E. H. COOMBE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Clean Seed Wheat.

The necessity for farmers to exercise more care in the selection of seed wheat is forcibly demonstrated by the examination of the crops generally when they are reaching maturity. This has been particularly noticed in connection with Federation wheat, which is now very largely grown throughout the State. This wheat was one of the late Mr. W. Farrer's crosses, and was distributed by him in small quantities about 10 years back. To Mr. F. Coleman, of Saddleworth, is due the credit of having proved the suitability of this variety to South Australian conditions. In almost all the crops of Federation, however, a proportion of a taller-growing and later-maturing variety is noticeable. This was not so much the case when the wheat was first introduced, but it is evident that lack of selection on the part of farmers has resulted in an increase in the percentage of impurity in this variety. It would pay farmers well to go through their crops of Federation and gather a bushel or two of large, well-filled typical heads of Federation wheat from which to raise pure seed wheat, and the same remark, of course, applies to other varieties of wheat. There is no doubt that the deterioration of such a large number of wheats is due to the lack of selection, which is an absolute necessity if the desirable qualities of these new varieties are to be maintained.

Codlin Moth and Bitter Pit.

According to the reports from the inspectors of orchards, which are attached to the annual report of Mr. G. Quinn (the Horticultural Instructor), apple-growers had unpleasant experiences last year with codlin moth and bitter pit. The latter is reported to be extending in the Mount Lofty Ranges, and the Barossa inspector writes—"I am sorry to report that bitter pit has occasioned considerable loss, and has come out worse where heavy pruning has been given. Personally I am of opinion that the only thing to be done at present is to prune lightly and use manures to mature the fruit without producing excessive growth of wood." So far as codlin moth is concerned, the same inspector reports—"This disease was only bad in unsprayed and neglected orchards. Various sprays were used, and as far as I could judge the best results were obtained with arsenate and arsenate of lead. I certainly am of opinion that with judicious use of these mixtures there should be little loss incurred by the pest. As I stated, the difficulty is with the small allot-

ments and cottage gardens, where the work is not effectively carried out." The Inspector of Orchards for the Mount Lofty Ranges (North) writes—" Less rain fell during the time the fruit was maturing than has been the case for many years, but with few exceptions the temperature was low, which may have resulted in the abnormal development of the codlin moth ; for without question it has proved the worst for this pest that we have experienced for some time. Had the crop been heavier the ravages might not have been so conspicuous. I am pleased to report that on the whole more intelligent interest is being taken in the treatment of the orchards of the district with regard to spraying and bandaging, especially the latter ; but unfortunately the bandage only becomes useful after a large amount of mischief has been done. So far as spraying is concerned, those who have benefited most are the growers who commenced early and were the most attentive. In one or two instances I visited orchards that were practically immune from codlin. The orchards of Messrs. Wise and Sandercock, near Gumeracha, were practically clean. Mr. Wise sprayed with arsenate of lead, while his neighbor (Sandercock) made use of Kedzie's—both being equally successful. There is great difference of opinion among the growers regarding the effects of the chemicals used, but I am persuaded that much depends on the time when the application is made, and have seen many instances which justify this contention. In my previous report I directed attention to the number of small orchards in townships that were little better than breeding places for the codlin moth, and although the owners of many of these have gone to a little trouble with their trees, no great improvement has been effected. Many complain that they cannot go to the expense of buying the necessary apparatus, and find it impossible to get others who have the plant to spray their trees at the proper time. It seems to me that the only way to deal with such places is for the Government to take the matter in hand, and spray them at the cost of the small orchardists. I am of opinion that many would gladly pay, and the advantage of clean fruit would soon recommend the policy to the most apathetic." The Wirrabara inspector states that the codlin moth was worse in that district than he had ever known it. He goes on to say—" Spraying generally this year has not been successful. The growers put the cause down to the mixture used being of bad quality. Some growers used Swift's arsenate of lead, some mixed the arsenate of lead themselves, but in each case they say the stuff was no good. A few growers sprayed with Kedzie's with about the same result as Swift's. I think the cause of the failure of the spraying was due to late spraying. A number of growers did not procure their materials in time to catch the first brood. They did not order until they wanted the stuff, and then they found that it was not in the market, and had to wait for another shipment to come to hand. The first brood of caterpillars thus escaped the spray, and the summer being a long and dry one, with a big crop of apples, helped the moth to increase. Next spraying-time the growers say

they will procure their material in time. Mr. Passow had the best result from spraying in the district. With arsenate of lead he procured about 90 per cent. of clean fruit. I do not think arsenate of lead will be much used in this district next season."

Phillis Marvel Wheat.

The Secretary of the Advisory Board of Agriculture reports that he has had an inquiry from a member of the Agricultural Bureau for from 20 to 25 bags of good clean seed of this variety of wheat. Phillis Marvel was a variety raised a good many years ago by Mr. R. Marshall, formerly of Templers, but it was left to Mr. Phillis, of Snowtown, to propagate the wheat and introduce it to general cultivation. It is alleged to be rust-resisting, and is a prolific yielder in districts where the rainfall is sufficient to mature a somewhat late mid-season variety. As a hay wheat it ranks high, and is now grown as such on a considerable area of country.

Egg Circles.

During November egg circles were formed at Blumberg, Southern Yorke Peninsula, Frances, Mount Gambier, Marrabel, and Hamilton, making a total of 26 that have now been established. The supply of eggs has exceeded expectations, and is being well maintained. The quality of eggs is uniformly good, and there is evidence to show that members are taking care with their consignments. Were they to become careless and forward inferior eggs, they would quickly be discovered and the practice stopped. Each egg is branded with the number of the member, so that the brand is practically a guarantee of quality. The attempt to sell eggs according to grade and quality is meeting with gratifying success, particularly in Adelaide, where several of the large caterers are buying circle eggs at enhanced prices.

Farmers' Wheat Sheds.

One of the questions on which the Wheat Commission obtained a considerable amount of information in New South Wales and Victoria was the storage of wheat in sheds owned by the Railway Department or sheds erected by farmers in co-operation. The evidence was almost entirely in favor of the farmers adopting this means rather than storing with the merchant, and the Commission in its final report made the following recommendation :—"That the Railway Department be advised to promote the erection of farmers' storage sheds in any locality by providing sites at a nominal rental, and that the Government advance the money necessary for the construction of such sheds (if requested), the amount to be repayable with 4 per cent. interest over a period of 10 years, the advance to be upon the guarantee of those

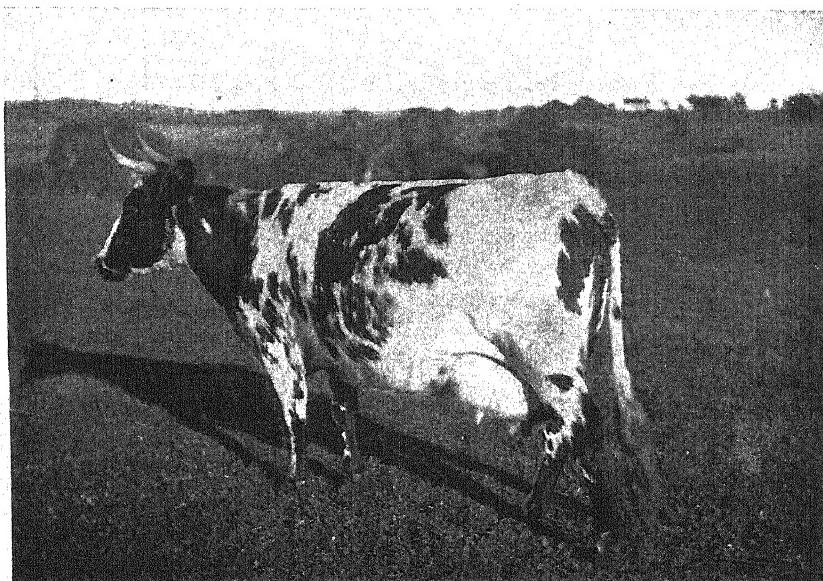
interested." Some interest in the proposal has been shown by South Australian farmers, and in reply to an inquiry Mr. J. Würfel, of Balaklava, has received a letter from Mr. H. Duffy, secretary of the Farmers and Settlers' Association at Henty, New South Wales, from which the following is taken :—
" The Railway Department erect grain sheds at all recognised wheat-growing centres when a demand is made for them by the Farmers and Settlers' Association. The Railway Commissioners then lease the shed annually to the association, charging them 4 per cent. on the outlay. Our shed is supposed to cost about £800 ; so we pay £32 per year. The shed is divided off into 39 spaces, for which we charge £1 6s. 3d. per space. It pans out at less than $\frac{1}{2}$ d. per bag for storage to the farmer. You can store over 700 large-size bags in one space. We clear about £16 profit each year on it. It costs us nothing to look after. Each farmer gets a space, which is numbered ; and if he sells or trucks it away he takes from his allotted space. It is a decided advantage to the Railway Department to have these sheds ; in fact, if they did not have them they would not be able to keep sufficient trucks on hand to deal with the wheat harvest. It is purely a business transaction with them, as they are assured of the carrying of the wheat at other times of the year when they are not so busy as at harvest time. From a farmer's point of view the idea of grain shed accommodation is splendid. Any person that can afford to hold his wheat for a rise can store it at a small cost, and two farmers, if they have a small lot, can halve a space. Last season I could have rented all the spaces in a grain shed twice as large as ours if we had had it. Our shed is one of the largest in New South Wales."

The Grocers' Exhibition.

The London correspondent of the *Pastoralists' Review* writes as follows respecting the Grocers' Exhibition in London :—" The South Australian Government had one of the largest and most effective displays of the whole exhibition. The variety of produce was not great, but what there was was of the best, and effectively arranged. Rosy-cheeked apples, which the public is informed were gathered in the State in April this year, were artistically arranged in little pyramids by themselves all round one side of the stand, and there were wheat, honey, dried fruits, and other edible produce in great profusion. A most effective centrepiece was a large and very handsome basket of peaches, grapes, and other varieties of fruit ; and this was a great attraction, especially to the ladies. I was much struck with the splendid show of dried fruits, of which the stall-dressers had made the very best display. The attendants were kept busy all the day answering queries, and things looked very prosperous."

A Fine Dairy Cow.

There are only a few Ayrshire cows at the Government Dairy Farm at Turretfield, but one of them, "Blue Ribbon of Turretfield," is the best milker on the place. In one month she gave 1,547lbs. of milk—within a fifth of a gallon of 155galls. or 5galls. per day. The milk test showed 3·8 per cent. of fat, and the amount of butter produced was 69lbs., which was sold at an average of 1s. 3d. per pound. The result for the 31 days was £4 6s. 6d., which represents 19s. 6d. per week.



"BLUE RIBBON OF TURRETFIELD."

Albert Molineux Memorial.

The Angaston Branch has very fittingly recognised the life work of the late Mr. Molineux in the following communication sent to the Advisory Board:—"Knowing the great benefit derived by producers generally and Branches of the Bureau in particular from the life work of the late Albert Molineux, this Branch willingly subscribes £5 on condition that 50 other Branches do likewise, and that the Board ask the Government to subsidise pound for pound the sum so donated." The excellent spirit in which this offer is made will appeal to every member of the Bureau, and probably other Branches will not be slow to co-operate in the matter.

Imports and Exports of Fruit and Plants.

The inspectors under the Vine, Fruit, and Vegetable Protection Act of 1885 admitted at Adelaide during the month of October 9,268 bush. of fresh fruit, 10,856 bags of potatoes, 591 bags of onions, and 20 packages of plants. Three hundred and six bushels of bananas were destroyed. The exports to inter-State markets consisted of 8,645 bush. of fresh fruit, 2,945 packages of vegetables, and 34 packages of plants, examined at Adelaide; in addition, 142 bush. of citrus fruits were passed at Renmark. Under the Commerce Act 1,084 bush. of fresh fruit, one package of dried fruit, and 86 packages of preserved fruit were exported. These were distributed as follows:—For New Zealand, 1,080 bush. citrus fruits and 25 packages preserved fruit; for India and East, three cases oranges and 61 packages preserved fruit; for London, one package dried fruit and one of oranges. Under the Federal Quarantine Act 3,007 packages seeds, bulbs, plants, &c., were inspected and admitted from oversea ports.

Milking Machine Test.

Because of the scarcity of labor for dairying work, and the disinclination of hired help to milk cows by hand, the Nebraska Experiment Station has carried out an exhaustive test of machine-milking, no less than 53 cows having been milked by machinery at different periods. The following conclusions, based on the experiments, have been published:—1. Heifers in their first lactation apparently give better results by machine-milking than do aged cows that have been accustomed to hand-milking for one or more years. 2. Some cows are not adapted to machine-milking. 3. Alternate hand and machine methods of milking have a detrimental effect upon the milk flow. 4. Manipulation of the udder is absolutely necessary in some instances before all the milk can be drawn by the machine. 5. One man operating one machine can milk about the same number of cows per hour as one man milking by hand. 6. It was found in this test that only 30 minutes was saved by one man operating three machines in place of two when 60 cows were milked. This saving of time would not balance the lack of thorough work when the operator was using three machines. It was found that two machines in the hands of one operator insured the most satisfactory work. 7. Two men operating four machines can practically do the work of three men milking by hand. 8. One operator with two machines can milk between 10 and 11 cows per hour, and two operators with four machines about 21 cows per hour. 9. It was found necessary to thoroughly wash and boil the milking machine parts after each usage, in order to produce milk with as low a bacterial content as that resulting from careful methods of hand-milking. 10. Washing the machines at irregular intervals or simply drawing water through them will increase the bacterial content of the milk even above poor methods of hand-milking. 11. The man operating the milkers must

thoroughly understand the care and management of dairy stock. He should also be persistent in the attention to details in order to obtain the best results. 12. From these studies it would appear that the milking machine is fitted for large herds rather than small ones, and we believe it would be impracticable to install them where fewer than 30 cows are milked the year round.

Lucerne for Soil Improvement.

Alfalfa (lucerne) is just as important as an improver of the soil as it is as a hay crop. If the farmers of Idaho realised this and managed their cropping accordingly they would be vastly more prosperous. The difficulty is not that there is not enough alfalfa grown, but that the farmers are loth to plough it up and introduce some rotation. We find that our soils are very well supplied with the mineral elements essential to plant growth, but are deficient in humus and nitrogen. Fortunate it is that these constituents which are lacking can easily be added by growing alfalfa. Such crops as small grain, potatoes, and sugar beets add scarcely any nitrogen; but, on the other hand, draw upon that contained in the soil. Grain stubble and such portions of those crops as become incorporated into the soil supply humus. Since alfalfa is our chief leguminous crop and can supply the nitrogen which ordinary crops do not add to the soil, its great value for soil improvement may be appreciated. Nitrogen is found in abundance in the air, but ordinary crops cannot take it up and utilise it in its gaseous form. The so-called nitrogen-fixing bacteria which are found in the nodules on alfalfa roots take up atmospheric nitrogen and elaborate it into nitrogenous compounds (protein) which are assimilated and stored up in the leaves and stems of the alfalfa plant. It is this protein which makes alfalfa such a valuable forage. The root growth of the plant and the decay and renewal of tubercles on the roots enriches the soil with nitrogen. Leaves dropping off also add some. By ploughing under a crop of alfalfa a still greater amount of nitrogen is added to the soil. In these various ways alfalfa enriches the soil.—*Report of University of Idaho Experiment Station.*

"Weeds, Poison Plants, and Naturalised Aliens of Victoria."

This is the title of a book recently issued by Mr. A. J. Ewart, D.Sc., Ph.D., F.L.S., the Victorian Government Botanist and Professor of Botany in the Melbourne University. It is only at long intervals that botanical works of this character are issued in Australia, and it is an interesting coincidence that while Mr. Ewart was engaged in compiling his list of plants introduced into Victoria Mr. J. M. Black was similarly engaged in Adelaide on his book, "The Naturalised Flora of South Australia," which was published about two months ago. Mr. Ewart's work is divided into two parts. In the first he

deals with the poisonous, injurious, and proclaimed weeds (native and introduced), and a number of the plants are splendidly illustrated with colored plates. There are some interesting comments respecting each plant, and practical advice is given as to the best means of dealing with those that are objectionable. The second part of the book consists of a census of naturalised aliens, and there are 364 in the list, 220 of them being described as useless and more or less troublesome weeds. The book is one that should be of great value and practical use to agriculturists.

Harrowing and Rolling Wheat.

The agricultural experiment station connected with the University of Nebraska, at Lincoln, U.S.A., has recently published the results of four years' experiments in harrowing and rolling winter wheat crops. The report states—"The plots were all sown to Turkish Red winter wheat, some being sown broadcast and others put in with a press drill. It was planned to harrow the wheat after it was up. Some of the plots were to be harrowed in both fall and spring, others to be harrowed only in the spring, while a third set were to be rolled." After giving a summary of the harvest results, the report continues—"It is apparent that during the past five years no increased yield could be secured from harrowing winter wheat. Harrowing broadcasted wheat resulted in an average loss of almost 3bush. per acre, while harrowing drilled wheat resulted in a loss of nine-tenths of a bushel per acre. It should not be assumed from the above data that the cultivation of wheat would not be of value in drier regions. Cultivation is for the purpose of conserving moisture; but in the years in which the above data were taken on wheat there was no lack of moisture; in fact, in the two seasons when spring rainfall was below normal (1905 and 1906) there was some increase from cultivation. Rolling winter wheat in the spring has not failed in any of the four years to give an increased yield, the average increase being 5·1bush. per acre. The rolling was given early in the spring, soon after the frost was out, and about the time growth started. Harrowing after rolling was not as good as rolling alone, probably due to loosening up the plants again after the roller had pressed them firmly into the soil. Early spring rolling of winter grain, pressing the earth as it does firmly about the plant roots, produces good results. When frost comes out in the spring it is very apt to leave the soil filled with small cracks or checks, especially around the plants. If these checks are examined closely it will be seen that a large number of roots are thus exposed, and if the weather continues dry they are killed, or at least injured. We have taken up plants in the spring where half of the roots were injured in this manner. If the soil is not wet at the time of rolling—and it should never be rolled when wet—rolling aids in no small degree to form a surface mulch. It does this rather than compact the surface."

MILLING QUALITIES OF SOUTH AUSTRALIAN WHEATS.

By W. ANGUS, B.Sc., and A. E. V. RICHARDSON, B.A., B.Sc.

For several years there has been considerable activity in all wheat-growing countries in the direction of improving both the yield and the quality of the varieties grown. In Canada and in the United States very good progress has been made with this work, while in England at the present time endeavor is being made to produce wheats combining the yielding power of the English varieties with the milling and the baking qualities of American wheats. In this work Australia has also been taking part. The late Mr. W. Farrer for many years worked quietly in the production of several new wheats of great value, one of which (Federation) is now probably the most widely grown variety in Australia.

South Australia is essentially a wheat-producing country, and this cereal is grown here under very varying conditions of climate and soil. To produce varieties most suitable to these different conditions is therefore a very large and important undertaking. Naturally, the greatest attention in all wheat improvement in the past has been given to the matter of yield. Under the present conditions of marketing this alone counts; but together with this must now be taken into account the quality of our wheats. America is finding it necessary to give this question further attention, and England is also endeavoring to improve the quality of her wheats. It is therefore essential that Australia, producing wheat for the same market, should see to it that the quality of her staple product is up to the requirements of that market.

In discussing quality in wheat one has to consider it from the point of view both of the miller and of the baker. What the former requires is a wheat giving a large yield of flour of good appearance, whilst the latter is not so much interested in the yield as in the production of a flour of such appearance and strength as will suit his particular purposes; hence in South Australia wheat-breeders have to aim at the production of varieties that will yield well, that will give a large percentage flour in the hands of the miller, and that will also satisfy the baker both in the color and the strength of flour. To do this it is first necessary to know how far the varieties commonly grown

possess these qualities. These have to be grown under observation, be carefully tested, and the results recorded. Then it is also necessary to collect the wheats that possess the qualities in which our varieties are deficient. Before improvement by means of cross-breeding can be undertaken a large amount of careful preparatory work has to be done, and when the crosses have been bred tests must be made to find out how far these new wheats possess the above-mentioned qualities; hence it has been necessary to provide means for milling small samples of grain. For this purpose a small experimental mill was installed in the laboratory of the department for the purpose of practically testing the milling quality of different wheats. This mill promises to be of invaluable assistance in connection with the work of wheat improvement which is being carried on at the Parafield Experimental Station. The actual milling of the samples has been done by Mr. W. Bott, an expert miller, and his advice on the various samples milled has been of very great assistance.

METHOD OF MILLING.

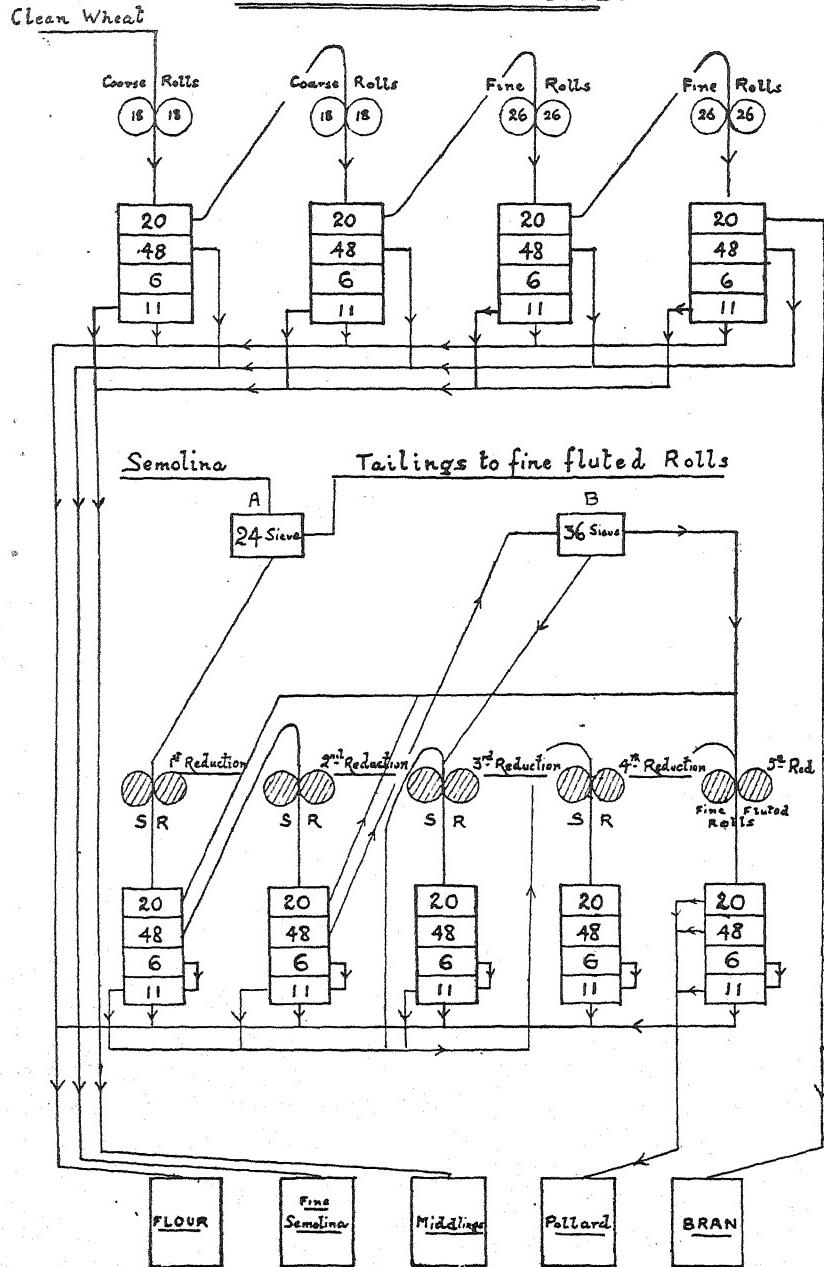
By means of this small mill it is possible to produce from small quantities of grain practically the same flour as would be obtained by a miller from the same variety of grain. To test the milling quality of the grain a small quantity of the given grain is specially cleaned by hand-picking and by rubbing the wheat grains briskly on a set of steel scourers. A weighed quantity of the wheat is placed in the hopper of the mill and rolled by a pair of No. 18 coarse-fluted rolls (*vide* diagram). The products of this break fall consecutively on a No. 20, 48, 6, and 11 sieve. The "overtails" from the No. 11 sieve form the "middlings," whilst the "throughs" from that is known as the break flour. The overtails from the No. 48 sieve run to the fine "semolina" box.

The tailings from No. 20 sieve are treated to a second break on the same coarse-fluted rollers. The product of this second break falls on the same set of sieves as before, and the siftings and overtails run to the same boxes at the bottom of the mill.

The third break is carried out on the overtails from the No. 20 sieve of the second break and passes through the same cycle of operations as before. The overtails of the No. 20 sieve in the fourth break constitute the bran.

The semolina, *i.e.*, the tailings of the No. 48 sieve, is first treated with a No. 24 hand sieve. The tailings from this sieve are subsequently treated, in common with other tailings presently to be described, with fine-fluted rolls. The siftings of this sieve are reduced on the smooth rolls. This is the first reduction. The products, if fine enough, fall in succession through sieves No. 48, 6, 11, and thence to the flour box.

FLOW SHEET OF MILL.



The overtails from sieve No. 20 are treated with the tailings from No. 24 sieve above mentioned with fine fluted rolls in the pollard reduction.

The tailings from the No. 48 sieve pass through the smooth rollers again for a second reduction, and the products of this reduction undergo a similar set of movements as before. The tailings of the No. 48 sieve pass to a No. 36 hand sieve, and the siftings of this sieve—together with the tailings of the No. 11 sieve of the first and second reductions—are thrown on the hopper for a third reduction. The overtails from the No. 36 sieve pass on to the fine-fluted pollard reduction rolls. The tailings from the No. 11 sieve in the third reduction are subjected to a fourth reduction on smooth rolls, and in normal cases this is sufficient to completely reduce the tailings to allow them to pass through the No. 11 sieve.

In the pollard reduction the tailings from the Nos. 20, 48, 6, and 11 sieves pass into the pollard box, whilst the siftings go to the flour box.

The accompanying diagram shows the flow of products in the mill, and will assist in making clear the points enumerated above.

DETAILS OF FLOUR-TESTING.

In the determination of the quality of a flour there are three factors which must always be considered, viz., strength, color, and gluten content. The flavor, amenability to certain modes of working, and other special qualities can scarcely be said to come within the province of flour-testing for general purposes. In flour of good baking quality the color, strength, and gluten content should be satisfactory. In the actual determination of these qualities it is imperative that the results should not only be comparative, but absolute. The results, that is to say, must not merely give a record of the properties of one flour against another, but they should definitely register the amount and character of each particular quality.

1. *Strength*.—There has been no little confusion as to the meaning of the strength of a flour. It has sometimes been defined as the "measure of the capacity of the flour for producing a well-risen loaf." But, unfortunately, there is at present no satisfactory way of numerically registering strength, except through a baking test, when it becomes possible to measure the actual volume of a loaf produced from a given sample of flour. In practice it is most convenient to look upon the strength as equivalent to the water-absorption capacity of the flour. This property is of extreme importance, because it determines the yield in bread and also the lightness of bread made from a given flour. The strength is estimated by determining the water absorbing capacity of the flour, and is usually stated in quarts of water required by a 200lbs. sack of flour to produce a dough of a given consistency (fit for baking purposes).

2. *Color.*—The color of flour is an important consideration for the baker. His customers insist on having bread of snow-white color, and so long as the public demand for such bread continues so long must the question of color be of first-rate importance to him. Among the various methods of judging the color the most obvious is that of testing the flour itself in the normal dry condition. But it must be remembered that the color of the dry flour depends not merely on the nature of the wheat and flour constituents, but also on the comparative coarseness or fineness of the particles of flour. The usual method of ascertaining the color is by means of Pekar's test. A small quantity of flour is placed on a clean ground-glass slide and pressed into a cake by a spatula. The compressed cake is then immersed in water, so as to wet the surface; then allowed to drain and dry. By this means the tint of the flour considerably darkens, as a result of the formation of colored oxidative products.

3. *Gluten Content.*—The sticky, elastic mass left when starch is thoroughly washed out of the dough made from wheaten flour is called "gluten." The gluten is an important constituent of the flour, because it is owing to its presence that we are enabled to obtain a dough fit for baking purposes, and because it belongs to the group of proteids which form an essential part of our food; indeed, it is the gluten that gives a flour its nutritive value. The gluten is usually determined by making a given quantity of flour into a dough and then washing away the starch in a regulated stream of water. Simple as this may seem in theory, it is in practice an exceedingly difficult and tedious operation, and the chief difficulty consists in knowing when the whole of the starch has been removed and then stopping short of washing away any of the gluten itself. A more accurate and convenient method consists in determining the nitrogen content of the flour by the well-known Kjeldahl method, and then multiplying the percentage of nitrogen by 5.76. The factor 5.76 is used because of the assumption that the average nitrogen content of the flour proteids is 17.3 per cent.

The following table will indicate the percentage flour yield, color, strength, gluten content, consistency of dough, and behavior in the mill of the principal varieties of South Australian wheats.

MILLING RESULTS.

Name.	$\frac{\text{Malt}}{\text{Wheat}} \times 100$	Mill Products, Flour. Offal.	Color.	Strength.	Gluten.	Nitrogen.	Consistency of Dough.	Milling Notes.
		%	%		%	%		
1. Comeback . . .	19	71.9	28.1	Fair	48.8	12.0	2.79	Bran clean, semolina very gritty and yellow, pollard clean.
2. Pratt's Comeback	5	72.9	27.1	Fair	49.9	12.8	2.22	Bran and pollard clean, semolina gritty and yellow.
3. Bobs	5	72.6	27.5	Fair	47.5	13.53	2.35	Bran rather small, pollard clean, semolina gritty and yellow.
4. Yandilla King..	19	72.7	27.3	Good	45.5	8.9	1.64	Bran and pollard clean, semolina whitish, somewhat gritty; easy to mill.
5. Marshall's No. 3	19	72.1	27.9	Good	45.8	11.3	1.96	Bran and pollard clean, semolina white, soft; easy to mill.
6. Federation . . .	2	72.8	27.2	Fair	45.9	10.04	1.74	Bran large and clean, semolina white and soft, very easy to mill.
7. Ghryas	18	71.9	28.1	Fair	40.8	10.7	1.86	Bran and pollard clean, semolina white and slightly gritty, easy to mill.
8. King's Early . .	3	70.7	29.3	Fair	37.3	12.4	2.17	Bran large and clean, semolina soft and slightly pinkish.
9. Nhill	12	71.9	28.1	Poor	43.4	12.76	2.24	Bran large and clean, pollard soft and fluffy, semolina white and gritty.
10. Nonpareil . . .	2	72.8	27.2	Very bad	40.0	14.8	2.6	Bran large and clean, semolina slightly gritty, easy to mill.
11. Red Velvet . . .	2	72.3	27.7	Fair	44.0	9.7	1.70	Bran and pollard clean, semolina yellowish, easy to mill.
12. Schneider . . .	2	70.0	30.0	Bad	40.0	11.9	2.1	Bran fairly clean, semolina soft and white, easy to mill.
13. Smart's Early . .	2	73.5	26.5	Fair	43.0	9.7	1.70	Bran large and clean, pollard clean, semolina slightly gritty.
14. Petatz Surprise	1	70.0	30.0	Fair	45.0	8.2	1.44	Bran large and fairly clean, semolina softish and white.
15. Purple Straw . .	4	71.6	28.5	Fair	40.2	10.9	1.89	Bran large and clean, semolina whitish and soft; easy to mill.
16. Dart's Imperial	5	71.9	28.1	Fair	41.9	9.2	1.59	Bran and pollard clean, semolina light yellow and slightly gritty.

(To be continued.)

GOVERNMENT INSPECTION OF STALLIONS.

The Official Report.

The Chief Inspector of Stock (Mr. R. J. Needham) has forwarded the following report to the Commissioner of Crown Lands with respect to the examination of stallions by the officers of his department :—

"I have the honor to forward herewith the report of the Government Veterinary Surgeon on the work done by the veterinary staff in connection with the examination of stallions for the period from September 14th to November 15th, 1909, and in doing so would draw your attention to the courtesy and assistance received by the staff from the Agricultural Society's officials all over the State, which has conducted very materially to the success and smooth working of the examination. Though the percentage of rejections for unsoundness has been high (caused no doubt by the influx of rejected horses from Victoria), no appeal against the refusal to give certificates has been lodged, and owners of horses have given the staff every assistance. I beg to submit that most valuable work has been done, that the staff have carried out their duties tactfully and thoroughly, and the large number of horses rejected shows how urgently the work was required."

MR. MCEACHERN'S REPORT.

Live Stock and Brands Department, Adelaide, December 3rd, 1909.

Sir—I have the honor to submit the following report on the examination of stallions for soundness for the period September 14th to November 15th, 1909.

Owing to a general consensus of opinion as to the urgent need for a more careful selection and veterinary examination of stallions, a deputation of prominent officials of the Royal Agricultural and Horticultural Society of Adelaide waited on the Hon. the Commissioner of Crown Lands on the 24th August and placed their views before him regarding this important question. As a consequence in September last the Stock Department, acting on instructions from the Hon. the Commissioner of Crown Lands, inaugurated a system of veterinary examination of stallions. As an innovation of this character was bound to be resented by certain sections, the department carefully

refrained from introducing stringent measures enforcing compulsory examination, but decided to follow Victoria's example and make it conditional for stallions competing for prizes at any show subsidised by the State to hold the Government certificate of soundness.

Efforts of this character are praiseworthy in the extreme. Critics have complained that it seems a pity that something more radical could not have been at least attempted. It is of course necessary to bear in mind the difficulties which must be dealt with. Criticism should not be harsh. It is to be hoped that this experiment, initiated for the benefit of the stockowners of the State, may be brought to a successful issue.

Regulations were framed and copies forwarded to the various agricultural societies. [The regulations were published in the October issue of the *Journal*.] Great interest was evinced in the Government proposals; the officials of the Royal Agricultural and Horticultural Society, Adelaide, manifested much enthusiasm, and a large number of the country show officials did likewise. The veterinary officers were offered every facility by the officials of the shows visited, and they are indebted for valuable assistance given.

At nine shows Mr. Loxton (Assistant Government Veterinary Surgeon) acted in conjunction with me in the examination of the stallions presented. At six he acted solely, and at five I personally conducted the examination. I would like at this stage to record the admirable and tactful manner with which the Assistant Government Veterinary Surgeon carried out his difficult duties, and I would also thank the Deputy Chief Inspector of Stock (Mr. Williams), and Stock Inspectors Doudy, Winkler, and Curtis for their assistance.

The following table will show the number of horses examined by the officers with the percentage of rejections, viz. :—

Officers.	Number of Shows Visited.	Number of Stallions Examined.	Number of Stallions Refused Certificates.	Per centage Refused Certificates.
J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon), and C. A. Loxton (Assistant Government Veterinary Surgeon) in conjunction	9	122	33	Per cent. 27.05
J. F. McEachran, M.R.C.V.S.	5	73	16	21.9
C. A. Loxton, G.M.V.C.	6	49	13	26.5
	20	244	62	25.4

Unfortunately, owing to several shows occurring in widely-scattered districts on the same day, with the limited staff of veterinary surgeons at command the department was unable to arrange for the examination of stallions at all the shows of societies in accord with the Government scheme.

A few owners expressed dissatisfaction with the examination arrangements. Horses were examined prior to judging, and in a few instances the owners did not present the horses for examination until near judging time, and, notwithstanding expeditious examination of stallions and issue of certificates to sound horses, a little confusion occurred.

However, it will be much better to examine horses at special parades arranged for the purpose, and I would respectfully recommend the department to have such a scheme carefully organised and timetables prepared for 1910.

Examination and Rejection.

During the period September 14th to November 15th, 1909, 244 stallions were examined, 160 certificates were issued, and certificates were withheld from 62 horses (25·4 per cent.) on account of the existence of hereditary unsoundness. Twenty young animals were examined, but not certificated, and there was an incomplete examination in two cases. The high percentage of rejections is no doubt due to the influx of unsound rejected horses from Victoria.

Amongst draught stallions the unsoundnesses met with were in order of frequency—ringbone, sidebone, unsound feet, and spavin. No fewer than 27·2 per cent. were affected with ringbone and 22·3 per cent. with sidebone; in 12 horses the two diseases together. Only one draught stallion was detected with bone spavin. In light horses certificates were refused principally for bone spavin and ringbone. Only one light stallion was affected with sidebone.

Two of the commonest unsoundnesses I have seen amongst horses in South Australia are undoubtedly ringbone and sidebone. These formidable imperfections are handed down from parent to offspring, and seriously lessen the value of the animals; and practical observers cannot but acknowledge that these two hereditary unsoundnesses have been largely on the increase in recent years. That the ringboned stallion is a potent factor in the transmission of this taint to the horse stock of the colony is a matter of common knowledge. Horses with round bones, upright or very slanting pasterns, are particularly prone to ringbone, and in the majority of cases the progeny of the ring-boned sire or dam will sooner or later develop the disease.

Table A illustrates the number of draughts and light stallions submitted for examination with reason for rejection, and Table B gives an analysis of the unsoundnesses met with. It will be observed that 20 young animals under two years were examined, but not certificated, and certificates were withheld from two horses because of incomplete examination.

TABLE A.—*Reason for Rejection.*

Unsoundness.	Draughts.	Lights.
Ringbone and sidebone	12 ..	—
Ringbone	14 ..	5
Ringbone and spavin	— ..	4
Ringbone and curb	— ..	1
Ringbone and unsound feet	2 ..	—
Ringbone and bursal enlargements	— ..	2
Sidebone	10 ..	1
Sidebone and bone spavin	1 ..	—
Sidebone and unsound feet	— ..	1
Bone spavin	— ..	5
Bone spavin and curb	— ..	3
Bone spavin and bursal enlargements	— ..	1
Total	39 ..	23

TABLE B.—*Showing Percentages of Unsoundness detected in Stallions**Examined.*

	Draughts.	Lights.	Total.
Number examined	103 ..	141 ..	244
Number certificated	49 ..	111 ..	160
Number rejected	39 ..	23 ..	62
Percentage rejected	37.8 ..	16.2 ..	25.4
Young animals	14 ..	6 ..	20
Incomplete examinations	1 ..	1 ..	2

Hereditary Unsoundness.	Draughts.		Lights.		Totals.	
	Number Affected.	Per cent. Affected.	Number Affected.	Per cent. Affected.	Number Affected.	Per cent. Affected.
Ringbone	28	27.2	11	7.8	39	15.9
Sidebone	23	22.3	2	1.4	25	10.2
Bone spavin	1	.9	13	9.2	14	5.7
Unsound feet	2	1.9	1	.7	3	1.2
Curb	—	—	4	2.8	4	1.6
Bursal enlargements	—	—	2	1.3	2	.8

Twelve draught horses were affected with both ringbone and sidebone; one draught horse with sidebone and bone spavin; two draught horses with ringbone and unsound feet. There was an entire absence of curb amongst draughts, and only one draught horse was detected with bone spavin. Four light horses were affected with both ringbone and bone spavin; one light horse with ringbone and curb; one light horse with ringbone and bursal enlargements; one light horse with sidebone and unsound feet; three light horses with spavin and curb; one light horse with spavin and bursal enlargements.

Transmission of Disease.

When possible the examining officers watched for the evidence of hereditary unsoundness in the young stock of unsound stallions, and in three instances direct transmission of hereditary unsoundness could be traced.

Four descendants of a roadster stallion affected with bone spavin were examined, and two had bone spavin and ringbone and one bone spavin. The sons of two draught stallions rejected for ringbone were also disqualified for that unsoundness, and other instances of direct transmission of hereditary taint were noted.

Breeding, Type, and Conformation.

In the course of the examination the examining veterinary surgeons were particularly struck with the number of stallions lacking in type, breeding, and conformation; and ponies were the principal transgressors. It is very important that a careful selection should be made of the sires both as regards unsoundness and breeding. It is highly essential that the breeding of young horses should be correct. No mistake should be made, no pains spared, and no expenditure shrunk from in the initial steps of the production of the finished animal. In the fight for improvement in our horse stock attention must be drawn to "weedy" stallions, and it is very desirable that animals defective in type, breeding, and conformation should be disqualified.

Victorian Certificated Animals.

Regulation IV. of Class III. states that the South Australian Government certificate of soundness will be issued to horses holding certificates of the Victorian and New Zealand Governments, and veterinary certificates of the agricultural societies of England, Scotland, and Ireland. A few horses with Victorian certificates and one horse with a New Zealand certificate were presented for examination. The description given in the certificates were in one or two instances meagre, and did not correspond with the actual distinguishing points of the animals submitted. Horses should be accurately described in the certificates, and the officials in charge of this particular branch should endeavor to have uniformity of description.

In connection with Victorian certificates I would respectfully draw your attention to Regulation IV. (1) Tenure of certificate of the regulations issued by the Victorian Government. Temporary certificates issued for three and four year old horses in 1907 and 1908 become life certificates. As hereditary unsoundness may have developed in these animals since date of examination, I am of opinion that this department should re-examine stallions four, five, and six years old holding the 1907 and 1908 Victorian Government certificate.

Disposal of Rejected Stallions.

The question of disposal of rejected stallions is an important one, and demands serious consideration. When Victoria commenced certificating stallions

the rejected animals were either utilised for stud purposes at a reduced fee, or sold to dealers, who dumped them into this State. New South Wales and Queensland Governments have adopted schemes for the certification of entires, so very soon the disposal of rejected animals will become a matter for urgent attention.

Before much can be done it will be necessary for each State to pass a uniform licensing Bill, or a Bill making it compulsory for all stallions utilised for stud purposes to be examined by a Government veterinary surgeon and certified free from hereditary unsoundness, and also approved for type, breeding, and conformation. Progress could then be made with the disposal of the rejects, and a system of insurance modelled on sound lines would probably meet the case.

Conclusion.

The results of the examination at the 20 parades held during the period will clearly demonstrate the justification of the steps the Government took, and it is to be hoped for the future benefit of our horse stock that not only will every stallion be certificated and guaranteed free from unsoundness, but that the horseowners will realise that a sound offspring can only result from a sound sire and a sound dam. However perfect may have been the pedigree and conformation of the sire, every good point may be neutralised by defect of form or lack of quality of the mare.

Yours obediently,

J. F. McEACHRAN, M.R.C.V.S.,

Government Veterinary Surgeon.

The Chief Inspector of Stock, Adelaide.

LIST OF CERTIFICATED STALLIONS.

From September 14th, 1909, to November 15th, 1909.

Name of Horse.	Age.	Owner.	Parade.	Date.
DRAUGHTS.				
Sir Hector McDonald . . .	8 years	Fitzgerald Bros.	Adelaide	Sept. 14
Southern Star	6 "	Hill Bros.	"	" 14
Wimmera Chief	5 "	C. H. Dunn	"	" 14
Rendelsham Major Gray . . .	5 "	N. Brookman	"	" 14
Eclipse	3 "	H. A. Montgomery	"	" 14
Blair's Pride	2 "	James Bodey	"	" 14
Bonny Style	2 "	"	"	" 14
Honest Harry	2 "	"	"	" 14
Pride of Glencoe	4 "	A. W. Davidson	"	" 14
Royal Sandy	3 "	J. M. & E. F. O'Sullivan	"	" 14
The Earl	3 "	J. J. Duncan	"	" 14
Pride of Barossa	6 "	F. Manzel	Gawler	" 22
Royal Enfield	3 "	H. Atwar	"	" 22
Glenmore	3 "	M. McCormack	Snowtown	" 22
Lord Ranfurly	5 "	Schroeder & Cousin	"	" 22

LIST OF CERTIFICATED STALLIONS—*continued.*

Name of Horse.	Age.	Owner.	Parade.	Date.
DRAUGHTS— <i>continued.</i>				
Sir Robert	4 years	W. H. Sires	Balaklava	Sept. 23
Ben Lomond	7 "	W. A. Steinweidei	"	24
Merry Oak	5 "	H. Wood	"	24
Prince Roy	6 "	G. Wait	"	24
Nobleman	2 "	R. Head	"	24
True Blue	11 "	W. Rodder	Moonta	29
Young Model Hero	7 "	C. R. Pfitzner	Eudunda	29
Young Model	3 "	W. G. Carter	Moonta	29
Royal Oak	4 "	E. Day	"	29
Oak Lad	3 "	R. A. Handcock	"	29
Ian's Pride	3 "	T. Travers	Orroroo	Oct. 6
Navy Blue	5 "	F. M. Wander	Two Wells	" 7
Clyde	8 "	J. A. Walker	Penola	" 13
Lord Kitchener	7 "	R. S. Sharam	"	" 13
Imperial King	4 "	J. Boyce	"	" 13
Prince	3 "	J. Dodd	Meningie	" 14
Young Flashwood	4 "	Fisher Bros.	Bordertown	" 19
Camellus	6 "	J. P. & L. Schinkel	Mt. Gambier	" 20
Lord Benmore	Aged	G. P. Hillier	"	20
The Masher	"	J. Holloway	"	20
Young Percival	3 years	Langley Bros.	Bordertown	" 20
Patch	2 "	A. L. Norman	Mt. Gambier	" 20
Young Kinloch	2 "	R. Savill	"	20
Early Morning	5 "	Thos. Colebatch	Strathalbyn	" 22
Marquis	4 "	M. B. Rankin	"	22
Paymaster	3 "	F. J. H. Cleggatt	"	22
Moeraki	5 "	W. E. Spehr	Millicent	" 27
Brown Boy	6 "	M. C. Kennedy	"	27
Conqueror	3 "	McKinnon Bros.	Pt. Elliot	" 27
Agent-General	4 "	F. T. Fisher, jun.	"	27
Young Native Oak	3 "	J. W. Tower	Millicent	" 27
General Laddie	7 "	Copping Bros.	Lucindale	Nov. 3
Prince Royal	3 "	Trustees late J. Grundy.	Yankalilla	" 5
Finstell Ambassador	6 "	W. Clezy	Woodside	" 15
LIGHT.				
Lord Collingwood	11 years	R. J. Dennis	Adelaide	Sept. 14
St. Elmo	7 "	A. Brown	"	14
Cashier	7 "	R. Crittenden	"	14
Producer	Aged	J. Grindall	"	14
Baron Rothchild	9 years	R. Smith	"	14
Frank Harold	7 "	Meyerhoff Bros.	"	14
Van Tromp	4 "	R. J. Dennis	"	14
Nutwood	2 "	"	"	14
Viking	2 "	Arthur Waterhouse	"	14
Wallace	2 "	F. Richards	"	14
Rio Grande	2 "	W. J. O'Leary	"	14
Clark's Hero	4 "	Meyerhoff Bros.	"	14
Simulator 2nd	6 "	H. Haydock	Gawler	" 22
Appremont	6 "	R. W. Rowett	Eudunda	" 29
Derby	3 "	H. Panell	Moonta	" 29
Foreigner	Aged	G. Wyatt	Two Wells	Oct. 7
Sir Thomas	5 years	J. Dodd	Meningie	" 14
Bosco	3 "	W. McAnaney	"	" 14
Otuuhu	3 "	"	"	" 14

LIST OF CERTIFIED STALLIONS—*continued.*

Name of Horse.	Age.	Owner.	Parade.	Date
LIGHT— <i>continued.</i>				
LeEnfield	3 years	R. Penny	Mt. Gambier	1909.
Listen-to-me	4 "	C. Nitschke	"	Oct. 20
Ostymarsh	6 "	F. E. Fisher	Strathalbyn	20
General	6 "	J. Dodd	"	22
Majuba	4 "	C. W. Lovell	Adelaide	22
Darkfish	4 "	F. J. Boteman	Millicent	25
Grenadier	7 "	W. Fergusson	"	27
McGrainger	3 "	John Nichol	Willunga	27
Whitebait	Aged	H. R. Raye	Yankalilla	29
				Nov. 5
PONIES.				
Wee Gibbie	6 years	A. J. Walkley	Adelaide	Sept. 14
Mickey	10 "	W. W. Bowell	"	14
Warrior	5 "	Sir Sam'l. Way	"	14
Little Warrior	Aged	H. Panell	"	14
Moses	"	H. Beach	"	14
King Edward	"	J. J. Fahey	"	14
The Duke	5 years	"	"	14
Nero	7 "	Capt. Geo. Walters	"	14
Golden Eagle	3 "	C. H. Angas	"	14
Roy	2 "	R. E. Gooden	"	14
Kinglock	3 "	F. Leaney	"	14
Roman Rung	4 "	F. E. Fisher	"	14
Tetrarch	3 "	P. Charlie	"	14
Little Corporal	2 "	"	"	14
Royal Warrior	4 "	Dr. T. K. Hamilton	"	14
Warrior Chief	4 "	"	"	14
Roman Emperor	3 "	Moore Park Estate	"	14
Bolliver	Aged	W. Richardson	"	15
Royalty	6 years	F. Richards	"	15
The Duke	8 "	W. Wallace	"	15
Brigand	Aged	M. J. Howard	Gawler	22
Chuminy	"	W. E. Lovell	"	22
Welsh Lad	4 years	W. Fuller	Snowtown	22
Little Toff	8 "	J. E. Linke	Balaklava	23
Robin Hood	5 "	F. F. Saint	"	23
Rory O'More	4 "	Kemp Bros.	"	23
Abdalla	9 "	J. C. O'Shea	Eudunda	29
Foreign Oak	8 "	Tom Duell	"	29
Nimble Dick	4 "	T. Rowe	Two Wells	Oct. 7
Smuggler	7 "	A. J. Berriman	Saddleworth	8
Furred	Aged	Lisle Johnson	"	8
Australian Spy	4 years	J. Maxwell	Penola	12
Zero	6 "	C. W. Flint	"	12
Tony the 2nd	Aged	W. Gammon	"	12
Midnight	"	T. H. Morris	"	13
Red Gum	5 years	J. W. Rackham	"	13
King Billy	7 "	T. J. Aston	"	13
Peter	8 "	M. Rogers	"	13
War Eagle	8 "	J. Reilly	"	13
King George	Aged	P. Charlie	Meningie	14
Sir Garnet	3 years	D. Roberts	"	14
General Tracey	4 "	T. N. Skinner	Bordertown	19
Happy Jack	Aged	A. Mackay	Mt. Gambier	20
Blue Gum	"	W. Kinghorn	"	20
Commodore		O. Gaden	"	20

LIST OF CERTIFICATED STALLIONS—*continued.*

Name of Horse.	Age.	Owner.	Parade.	Date
PONIES— <i>continued.</i>				
The King	Aged	Mrs. W. E. Watts	Mt. Gambier	1909.
General De Wet	6 years	Fisher Bros.	Bordertown	Oct. 20
The Kaffir	6 "	T. N. Skinner	"	20
The Nut	4 "	J. Q. Cox	"	20
Brownlock	3 "	R. P. Kay	"	20
Cymbell	4 "	W. R. Cross	Mt. Gambier	20
Red Gum	4 "	R. Smith	"	20
Brigadier	3 "	F. Wilkinson	"	20
Hero II.	Aged	W. Downs	Millificent	27
Victorian	"	J. McMorran	Lucindale	Nov. 3
Paris Junior	3 years	W. Haskett	Yankalilla	" 5
Brownie	3 "	M. Mullins	Woodside	" 15
THOROUGHBREDS.				
Young Damper	8 years	C. J. Beckmann	Snowtown	Sept. 21
Juggler King	4 "	John Ireland	"	21
The Admiralty	Aged	E. A. Wickens	Gawler	22
St. Vincent	"	H. Mentha	"	22
Juggler	11 years	W. R. Michael	Snowtown	22
Australater	4 "	W. Burns	Gawler	22
Good Morning Bill	Aged	A. Nichol	Balaklava	23
Strathline	3 years	Jas. Quinlan	Balaklava	24
The Castaway	6 "	T. Kineear	Moonta	29
Norback	6 "	A. Johnston	Eudunda	29
Scrutiny	7 "	T. Arthur	Orroroo	Oct. 6
Macquarie	Aged	R. Ellery	"	6
Young Pishoage	5 years	J. H. Wilson	Two We'l's	7
Ben Hur	Aged	Penny Bros.	Saddleworth	8
Trentbridge	"	E. Copping & Sons	Penola	12
Black Fish	7 years	Duncan Campbell	"	12
Rheostat	8 "	Jas. Mulqueeny	"	13
Whalebone	Aged	W. R. Cross	Mt. Gambier	19
Juniper	"	Langley Bros.	Bordertown	20
Fulgrote	3 years	W. Patten	"	20
Lord Thunderbolt	4 "	D. Mitchell	Mt. Gambier	20
Halloween	4 "	J. F. Kirby	"	20
Sojourner	Aged	J. Mullins & Sons	Strathalbyn	22
Fleetfoot	5 years	W. S. Day	"	22
Adrian	3 "	J. Mullins & Sons	"	22
Emuan-na-Knuck	"	A. C. Coote	Pt. Elliot	27

THE WHEAT CROP.—OFFICIAL FORECAST.

Probable Average, 11½ Bushels.

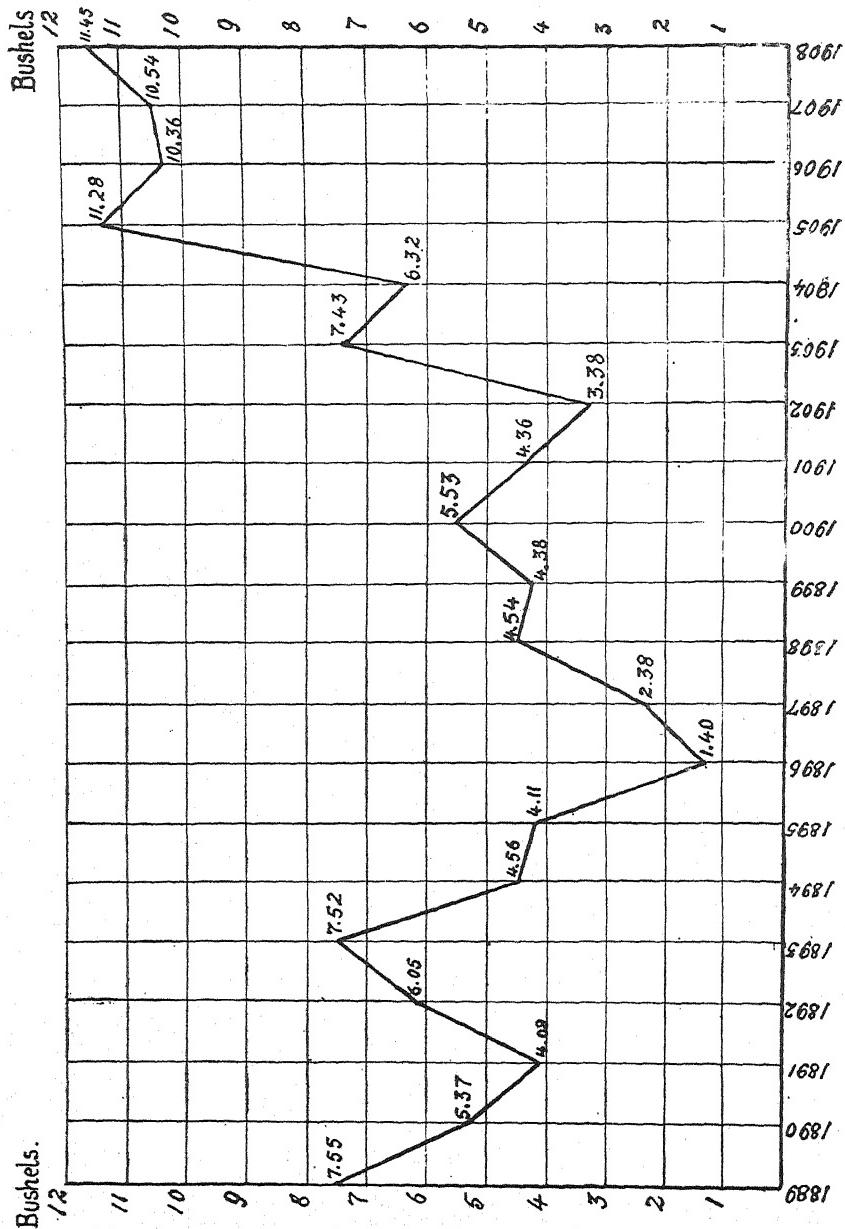
The Government Statist (Mr. L. H. Sholl) and the officials of his department have completed their estimate of the wheat and hay harvest for the season 1909-10, and the actual figures for the past season and the estimated ones for the present season are given in the tables on the following pages. The totals for the State are shown below alongside the estimates of the daily papers :—

1909-10.	Government Statist.	<i>The Advertiser.</i>	<i>The Register.</i>
	Acres.	Acres.	Acres.
Area under crop	2,108,195	..	2,161,802
Area to be reaped for wheat	1,772,675	..	1,861,802
Area to be cut for hay....	335,520	..	300,000
	Bushels.	Bushels.	Bushels.
Aggregate yield (wheat)..	20,139,575	..	19,638,224
Average per acre (wheat)..	11.36	..	10.54
	Tons.		
Aggregate yield (hay)	485,950	..	..
Average per acre (hay)....	1.45	..	..

In his report accompanying the forecast, which is dated November 30th, Mr. Sholl states—"The wheat-growing area of the State was divided into 458 districts, and the mounted constables in the various centres were delegated to furnish reports for each district as to—(1) the area under cultivation ; (2) weather conditions from April to November 20th ; (3) area likely to be cut for hay ; and (4) probable yield per acre of grain and hay. These reports were carefully written up on or about the 20th instant and then posted to this office. In addition, much valuable information was obtained by means of memoranda and reply postcards sent from this office to about 10 per cent. of the farmers in each hundred.

"Should the remainder of the harvesting season be generally favorable, this estimate will be realised and possibly exceeded, as in view of the peculiarities of the season many of the reports received have been considerably modified. Still, it is impossible to calculate the extent to which the crops suffered by the exceptionally dry spell of weather of September and October, though it appears in the light of the reports that the timely November rains to a large extent counterbalanced the bad effects of the dry spell. The area under cultivation for barley is much less than the previous year, though the yield is likely to be a good one. A considerable increase in the area cultivated for oats is reported, with prospects of a good yield."

The average wheat yield per acre for the last 20 years is shown by the following diagram:—



ESTIMATE OF THE WHEAT HARVEST, 1909-10

Estimate of the Area under Wheat, and the Probable Yield of Grain and Hay for the Season 1909-10, also the Actual Area and Yield for Season 1908-9.

Counties,	Area Under Wheat.						Yield.					
	Actual Area, 1908-9.			Estimated Area, 1909-10.			Actual, 1908-9.			Estimated, 1909-10.		
	Total.	Grain.	Hay.	Acre.	Acre.	Acre.	Grain.	Hay.	Tons.	Grain.	Hay.	Tons.
I. CENTRAL DIVISION—												
Adelaide	50,118	10,199	39,919	47,800	10,800	37,000	136,185	68,697	143,100	60,500	13,35	13,25
Albert	41,753	40,600	4,153	41,750	42,600	5,150	352,398	3,934	390,000	6,250	8,98	9,15
Alfred	23,686	21,128	2,558	27,000	23,800	3,200	196,863	2,425	241,950	3,650	9,32	10,16
Carnarvon	1,814	1,574	240	1,700	1,500	200	11,379	152	10,500	1,600	7,23	7,00
Eyre	72,344	61,594	10,750	69,630	60,800	8,830	525,116	10,618	548,800	11,500	8,53	9,03
Fergusson	135,148	123,634	11,514	138,240	125,500	12,740	1,527,910	13,456	1,610,480	17,490	12,36	12,83
Gawler	141,937	106,653	143,900	111,700	32,200	1,471,890	49,570	1,637,700	53,100	13,80	14,68	
Hindmarsh	26,046	18,137	7,909	27,310	19,530	7,780	220,807	11,991	212,940	9,410	12,17	10,90
Light	121,236	79,707	41,529	122,450	84,700	37,750	1,265,425	64,617	1,202,500	67,160	15,88	14,20
Sturt	75,043	62,300	12,743	77,925	63,700	14,225	626,761	15,442	595,400	17,140	10,06	9,35
Total	691,225	525,546	165,679	703,705	544,630	159,075	6,331,644	240,902	6,593,370	246,300	12,05	12,11
II. LOWER NORTH—												
Burra	26,013	21,208	4,805	24,400	20,250	4,150	290,363	5,960	216,900	4,350	13,69	10,71
Daly	237,285	208,420	28,865	238,660	210,660	28,000	2,562,885	40,518	2,714,300	43,200	12,30	12,88
Hamley	—	701	1,652	15,850	14,400	1,450	—	694	—	700	—	—
Kimberley	15,558	13,906	24,353	154,100	131,300	22,800	1,21,222	1,785	102,600	900	8,72	7,12
Stanley	153,907	129,554	40,105	156,900	123,400	33,500	2,027,675	49,977	1,818,850	36,150	15,65	13,85
Victoria	157,548	117,443	3,238	2,734	504	2,500	1,737,746	67,668	1,838,100	54,800	14,80	14,89
Young	—	—	—	—	—	—	20,364	390	13,200	300	745	6,00
Total	594,250	493,265	100,985	593,110	503,210	90,900	6,760,255	157,992	6,703,950	140,400	13,71	13,35

ESTIMATE OF THE WHEAT HARVEST, 1909-10—continued.

Estimate of the Area under Wheat, and the Probable Yield of Grain and Hay for the Season 1909-10, also the Actual Area and Yield for Season 1908-9—continued.

Counties.	Area under Wheat.						Yield.					
	Actual, 1908-9.			Estimated, 1909-10.			Actual, 1908-9.			Estimated, 1909-10.		
	Total.	Grain.	Hay.	Total.	Grain.	Hay.	Acre.	Grain.	Hay.	Tons.	Grain.	Hay.
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Bushels.	Bushels.	Bushels.	Tons.	Bushels.	Bushels.
III. UPPER NORTH—												
Blackford	10,790	9,625	1,165	10,150	9,150	1,000	59,720	982	63,250	8,50	6,20	6,91
Dalhousie	111,731	97,775	13,956	103,750	91,630	12,100	966,732	17,001	950,900	16,600	9,89	10,37
Derby	—	—	—	—	—	—	—	—	—	—	—	—
Frome	121,270	102,067	19,203	117,000	97,500	19,500	1,145,021	24,228	1,080,000	27,000	11,22	11,08
Granville	19,559	18,719	840	19,360	18,450	910	78,914	6,33	120,200	1,010	4,22	6,51
Hanson	26,337	24,850	1,487	26,000	25,000	1,000	127,044	1,188	160,500	800	5,11	6,42
Herbert	7,742	7,293	449	7,980	7,600	380	52,032	395	45,400	215	7,13	5,97
Lytton	30,080	26,467	3,613	29,660	26,650	3,010	160,400	3,337	189,775	2,490	6,06	7,12
Newcastle	50	—	50	—	—	—	—	40	—	—	—	—
Total	327,559	286,796	40,763	313,900	276,000	37,900	2,589,863	47,814	2,610,025	48,905	9,03	9,46
IV. SOUTH-EASTERN—												
Buckleugh	19,879	18,619	1,260	29,560	27,000	2,560	151,049	1,105	239,000	2,650	8,11	8,52
Buckingham	21,692	19,951	1,741	25,450	22,550	2,900	230,236	1,820	203,450	3,620	11,54	9,02
Cardwell	1,384	1,045	339	2,000	1,800	200	6,060	166	15,300	150	5,80	8,50
Chandos	61,046	55,637	5,409	91,800	85,000	6,800	674,360	6,590	1,026,800	9,900	12,12	12,08
Grey	5,761	4,351	1,410	3,930	3,280	650	76,043	2,240	46,780	825	17,48	14,26
MacDonell	3,058	2,850	208	3,530	3,350	180	33,023	267	28,100	180	11,59	8,39
Robe	2,009	1,774	325	2,000	1,700	300	22,327	415	18,700	400	12,59	11,00
Russell	18,438	16,701	1,737	20,395	18,455	1,850	141,605	1,771	160,000	1,830	8,48	8,67
Total	133,357	120,928	12,429	178,515	163,35	15,440	1,334,703	14,324	1,729,130	19,575	11,04	10,60

SUMMARY.

- I. CENTRAL . . .
- II. LOWER NORTH
- III. UPPER NORTH
- IV. SOUTH-EASTERLY
- V. WESTERN

Total

Increase Decrease

"DRY BIBLE."

Report by Veterinary Surgeon Desmond.

Micro-organism Discovered.

The following interesting report by Veterinary Surgeon Desmond has been forwarded to the Minister for Agriculture :—

In January, 1903, the South Australian Council of Agriculture decided to inquire into the occurrence of a disease of horned cattle commonly known as "dry bible," and for this purpose some thousands of long circular letters were forwarded to owners of live stock. About 100 replies were received from different parts of the State, and when these were reviewed the following results were obtained, viz.:—Symptoms well-described, 16; cattle affected which were supplied with bone meal, salt, and sulphate of iron, 10; cattle affected on green feed, two; wrong diagnosis, four; illness supposed to be caused through eating poison weeds, two; abortive particulars, 66. These replies were far from being satisfactory, and when the owners of sick animals were asked why they did not answer the circular letter the usual reply was, "It was too complicated and contained too many questions." The circular contained over 40 questions, and asked for replies that were far too difficult for the average farmer to answer. In 1906 instructions were given that I was to make a study of the disease, and I proceeded to Murchard, where a great number of animals were affected. While studying the disease in this locality my services were asked for by the Government of Tasmania to assist the Government Veterinary Surgeon of the Island State to investigate a mysterious disease of cattle. While in Tasmania no difficulty was experienced in proving to the Government Veterinary Surgeon and the Chief Inspector of Stock that the disease affecting their cattle was identical with the disease that caused such a large death rate in cattle in South Australia and Victoria. While in Tasmania much laboratory work was done in order to solve the difficulty. The laboratory of the Launceston Hospital was placed at our disposal, and the work done was of great practical value in the present investigation. The cultures obtained in Tasmania are still growing in this laboratory, and are transferred every month.

In 1907 the Minister of Agriculture (Hon. L. O'Loughlin), recognising the seriousness of the trouble in the dairying districts of this State, gave instructions that I was to make a systematic study of the disease, with the object of finding out a means of prevention, and, if possible, a line of treatment for affected animals. It was then pointed out to the Hon. the Minister that he had given explicit instructions that on no account were the weekly lectures on

veterinary science at the Roseworthy Agricultural College to be put aside for any other work, and if it was decided to have the disease investigated additional help would be required to do the routine work of the veterinary department, and deliver lectures at the Roseworthy Agricultural College and School of Mines. The Hon. the Minister agreed to this; and Mr. Loxton was appointed to the position of Assistant Government Veterinary Surgeon in January, 1908. When Mr. Loxton had mastered the multitudinous duties attached to the veterinary department, I was at liberty to give my attention and endeavors to solve the mystery as to what was the cause of the trouble. In March of this year a visit was made to Orroroo, Quorn, and Hammond. At Orroroo and Quorn the cases were very scattered, while at Hammond a great number of cases were found under conditions that were favorable for a thorough investigation. A farm, which is recognised as a hotbed for the disease, where a large number of cattle succumb every year, the losses during the early months of the year amounting to several hundred pounds, and where all kinds of horned cattle, such as bullocks, cows, steers, and heifers were affected, was chosen as the site for studying the disease in all its phases. This farm had an abundance of feed and two wells of water. The conditions in which the cattle were kept were contrary to the general opinion that the dryness of the feed was the cause of the trouble. Opportunities were offered to study the three forms of the disease, viz., the acute form, in which death takes place in a few hours; the sub-acute form, in which the affected animals live many days; and the chronic form, when the animals are sick for many weeks, and from which recovery takes place in a small number of cases.

The symptoms of this disease in its many forms have been so often described in the public press that owners have no difficulty in recognising it when their cattle are affected. The following additional particulars were noted on close observation of sick animals:—1. In the acute stage the affected animals are easily excited and show well-marked brain symptoms, the pulse and respirations are increased, while the temperature is about normal. Unconsciousness occurs at short intervals, and the animal falls to the ground, lying with its nose to the flank, death taking place in from a few hours to one or two days. Such cases, when submitted to a careful *post-mortem* examination, show well-marked congestion of the delicate membrane covering the brain, and other symptoms which will be described in full in a future report. 2. In the sub-acute stage, besides the usual symptoms, such as the glassy eye, &c., there is a spasmodic jerking of the muscles of the fore part of the body and a continuous movement of the muscles above the eyes. 3. The chronic stage is most complex, and the deductions to account for the frequent unconsciousness must be postponed until a more definite investigation is made. Animals in this stage will partake of food and water and perform all natural functions, remaining in a recumbent

position for many weeks, until they are a mass of sores where their bodies come in contact with the ground, often causing the owner to destroy them to end their suffering, and to dispense with the cost of feeding and watering an animal in which there is only a remote chance of recovery. There are a few cases recorded by observant owners in which an affected animal has recovered from the disease, but has succumbed to a fresh attack in the following year. In the numerous cases that have been recorded only one case is known where an animal has survived a second attack. One important feature was observed during the present year. Stiffening of the muscles (*rigor mortis*) and decomposition, even when exposed to the fierce rays of the sun in summer, is not rapid. A disagreeable, foetid smell is given off from the carcass of an animal when submitted to a *post-mortem* examination a few moments after death takes place, or in animals that have been slaughtered for investigation purposes. Subsequent work in the laboratory decided what was the cause of this disagreeable odor, which will be accounted for in a future report. Cultures were made from all *post-mortem* examinations of animals slaughtered in different stages of the disease and from those that had recently died. Tubes of media were inoculated with smears from the different organs and glands. The difficulties of performing field bacteriology were overcome by a simple contrivance, and very satisfactory results were obtained. The weather was very warm, and an incubator for the development of any germs which were located in the tissues was not required. The majority of the inoculated tubes showed an abundant growth of various conditions and colors. These have formed the subject of extensive laboratory research.

While at Hammond I was ably assisted in carrying out the inoculation experiments by Mr. Loxton, the Assistant Government Veterinary Surgeon, who worked day and night in the laboratory in Adelaide at preparing the necessary medium for the cultures, a very large quantity of which was required, and for which telegrams were continually being forwarded. After spending three weeks in the North, the next step was to visit Adelaide for the purpose of submitting the large amount of material which had been collected to a very searching laboratory investigation, the result of which has been, after many weeks of work, that three unusual micro-organisms have been isolated and obtained in pure cultures. The next step was to inoculate animals with these cultures for the purpose of finding out if they would produce a disease that was known or otherwise. These organisms were numbered 1, 2, and 3. No. 1 in a pure form was injected in very large doses into two cows, and had not the slightest effect on their health, nor did it disturb them in any way. Culture No. 2 was next experimented with, and, although it did not kill the animals which were inoculated, it made them very sick, and put them off their food for several days. The next step was to inject cultures Nos. 1 and

2 mixed together. No fatal results were obtained, and the symptoms produced were identical as when No. 2 culture was the subject of inoculation. No. 3 culture, a most difficult organism to work out in its many phases, was next experimented with, and produced quite definite results. Several cows have been inoculated with it, and the following is a *resume* of its action :—A few moments after injection into a healthy cow there is a shivering fit, and the animal falls to the ground, the respirations are hurried, and the animal is very distressed. This, in the majority of cases, only lasts a few moments, and the animal will rise to its feet and present the following symptoms :—Pulse, respirations, and temperature much accelerated; trembling of the forequarters, twitching of the muscles above the eye, and a glassy appearance of the eyes. Death may take place in nine to ten hours, and in other cases a fatal issue is not obtained until several days. All the experimental animals were submitted to a most searching *post-mortem* examination, and all the lesions found in cattle which acquire the disease in a state of nature were present. Several sheep have been killed with this micro-organism, death taking place in about four hours. Although such a fatal organism to ruminants, the small laboratory animals—the rabbit and guinea pig—do not succumb to experiments. This germ has already been submitted to a searching investigation ; it has been repeatedly cultivated from the tissues of the various animals killed by inoculation, and when again injected into healthy cows has caused death under identical conditions. The rules which are laid down and which govern bacteriological research are termed the “postulates” of Professor Koch, and require that a micro-organism, to be recognised as a specific agent in the production of pathological alterations (diseased conditions) should fulfil four conditions :—“ 1. The micro-organism must be found in the blood, lymph, or diseased tissues of man or animals suffering from or dead of the disease. 2. The micro-organism must be isolated from the blood, lymph, or tissues, and cultivated in suitable media, *i.e.*, outside the animal body. These pure cultivations must be carried on through successive generations of the organism. 3. A pure culture thus obtained must, when introduced into the body of a healthy animal, produce the disease in question. 4. Lastly, in the inoculated animal the same micro-organism must be again found.”

All these conditions, which are in many cases not possible to put into practice when investigating diseases peculiar to the human subject, have been repeated many times in the case of the micro-organisms isolated in the prosecution of this inquiry.

One important observation was noted in the north of this State during the month of March, and is well worthy of being recorded. At a large dairy farm on which a great number of cows were milked this disease appeared for the first time, and naturally the owner was very alarmed. There could be no mistake as to the disease being the so-called “dry

bible," as I destroyed the affected animals and submitted them to a searching *post-mortem* examination. On viewing the conditions in which the cattle were kept it was discovered that the water supply was collected by blocking up a road on which there was much traffic, and turning the water into a large waterhole. It was decided to treat the water supply with a liberal amount of sulphate of copper. This was done under my supervision, with the satisfactory result that no more cases occurred on this farm. In the laboratory the following experiment was made:—A quantity of water from the Adelaide supply, after passing through a sterile pressure filter, was collected in a sterile flask and submitted to further sterilisation for an hour, by steam pressure at 15lbs., at a temperature of 250°F. This water was inoculated with a pure culture of the micro-organism which had killed the numerous cows inoculated with it, and placed in the incubator. A ready growth under these conditions was obtained. This experiment was conducted under Mr. Loxton's observations, who was astonished at the result. During September of this year a short visit was again made to Hammond, not for the purpose of seeing cattle affected with the disease, as the majority of cases occur in the autumn months, but to conduct inoculation experiments on animals which are kept in a locality where the disease appears every year. Five cows were secured; two were inoculated, while the remainder were brought on to Adelaide for further experiments. The two cows inoculated showed well-marked symptoms of the disease, and one succumbed after five days. The other, a large, strong cow, although very ill for seven days, survived the experiment, and it was decided to leave her in the locality for the purpose of observing future developments. A large number of farmers were interested in the experiments, and all were unanimous in declaring that the symptoms, as shown in the inoculated animals, were identical with "dry bible." The owner of the farm on which there was such a large death rate last autumn was present at the *post-mortem* examination on the cow killed by the inoculation, and he remarked, "I have removed the hides from scores of cattle which have died of 'dry bible,' and cut up the carcasses for burial or burning, and the appearance of this cow after the experiment and the condition of the internal organs are the same as the cattle affected on my farm."

In the *Journal of Agriculture of South Australia*, August, 1909, under the heading of "Mortality of Live Stock," the following numbers of cattle that have succumbed to "dry bible" are quoted from statistics furnished by the Government Statist:—"In 1907 there were 3,067 deaths from 'dry bible'; during 1908 there were 11,133 deaths of cattle, both within and outside counties, 'dry bible' being responsible for more than one-fifth of the number, namely, 2,395." The losses to this State are enormous, as the value of the animals can be computed to be between £4 and £5 per head. These figures are quoted in this report to show how necessary it is

to spare no expense to solve, if possible, a means of prevention, whereby animals in localities where "dry bible" is very prevalent can be prevented from being affected with this fatal disease. Such a step would be an important one in the interests of the economies of the State. I expect to elucidate many important additional features in the laboratory investigation now proceeding, which is of a severely searching nature, embracing all phases of the question, and which is necessary to verify those conclusions forced upon me so far by the definite reaction of those organisms isolated, and which I believe are the proximate cause of "dry bible." The details of this research, with all data, will form the subject of my report, which will be presented at the earliest possible date, and which must be withheld until complete verification enables me to reassure the public and to face the unrelenting inquiry of the scientific world.

J. DESMOND, Government Bacteriologist.

Adelaide, November 24th, 1909.



FARM EXPERIMENTS IN THE NORTH.

For some years past farmers in various parts of the State have undertaken experiments under the direction of the Department of Agriculture for the purpose of showing chiefly what varieties of grain are suited to each district, and what artificial manures are most desirable in each locality. With the object of inspecting some of these farms Professor Angus left Adelaide on Wednesday, November 17th, and spent a week in the North, going as far north as Hawker.

The first farm visited was that of Mr. F. Coleman, of Tuela, near Saddleworth, which consists of 1,200 acres, the soil generally being of the Bay of Biscay type. Mr. Coleman has a crop of Tarragon wheat which promises to yield 30 bush. to the acre. Other crops that were looking well were Federation, Yandilla King, King's Early, and Pratt's Comeback. The Special Comeback and Jonathan were not so good. Yandilla King does better in

this district than Marshall's No. 3, while King's Early does not do so well as at Roseworthy College. The crops on the manure plots showed the advantage resulting from the application of phosphates, although the "no manure" plot was a very good one. Mr. Coleman is also conducting experiments with 16 varieties of potatoes on behalf of the Department, and the plots were all very neatly arranged and the plants looking well. Some grass plots laid down three years ago on behalf of the Department were rather overgrown with weeds, but nevertheless some of the grasses had done fairly well, such as Rye Grass (both Perennial and Italian), Tall Fescue, Tall Oat Grass, Falling Awn, and Brome Grass. The clovers were more or less a failure.

At Dawson a dry-farming experiment is being carried out on behalf of the Department on the farm of Mr. C. H. Meyers. The farm comprises about 700 acres, of which 132 acres are under crop this year. The experimental plots are not looking well, being in most cases badly blighted. Mr. Meyers considers that this is due to the fact that too much super. (60lbs.) had been applied. The plants made very rank growth at first, and were more forward than the other crops, but just at a critical time a severe frost was experienced which had the effect of blighting the heads. The main crop was put in with 30lbs. of super. per acre, and in Mr. Meyers's opinion the crop will yield quite 12bush. to the acre. This is a satisfactory return from a district which has an average annual rainfall of only 10½in.

Mr. T. P. Tapscott's farm was visited for the purpose of seeing the competition wheats being grown there. Mr. Tapscott manured his main crop with 40lbs. of super., while the competition wheats received a dressing of 60lbs. per acre, but no apparent difference in the crop could be seen.

At Oladdie the dry-farming experimental plots of Mr. L. Chalmers were inspected. As at Dawson, the plots here are not looking well, about 50 per cent. of the heads being blighted. Agriculture in this district is gradually giving place to dairying, and farmers who at one time sowed 1,000 acres of wheat are now content to put in from 100 to 200 acres. They have found that it pays them better to utilise their land for grazing purposes.

A visit was paid to the Hawker district for the purpose of making arrangements for starting agricultural experiments there. The present season at Hawker is the best experienced since 1892, and the crops throughout the district promise to average about 10bush. an acre. This is practically the first season in which artificial manures have been used in the Hawker district, and farmers find that a light dressing, say 30lbs. to the acre, is a great advantage.

At Hammond the dry-farming plots are looking very much better than at Oladdie or Dawson, although they are not promising as well as last year. The lay land plot is looking almost as well, but the season seems to have been unfavorable to the dry-farming plots. Earlier in the year these looked

particularly well, and being more forward than the others, they suffered accordingly during the hot spell at the beginning of November. The varieties test in wheat which Mr. Griffin is conducting on behalf of the Department has been very successful. All of the varieties sown have done well, and some particularly so. The following varieties are being grown:—Special Comeback, Cumberland, Federation, Pratt's Comeback, Yandilla King, John Brown, Gluyas, and Early Viking. Of these Cumberland stands out as being particularly suited to the district, being an early wheat with a good sample of grain, and in this plot it looks equal to yielding from 16bush. to 18bush. per acre. Early Viking is another wheat that seems to suit the northern district about Quorn, and Mr. Griffin's crop looked like yielding 18bush. per acre. Mr. Griffin takes a keen interest in the experimental work, and his plots were all well laid out. His farm is an object of great interest in the district, and the result of his work is watched with much interest by his neighbors.

After calling at Mr. M. Corcoran's farm and inspecting the competition wheats being grown there, Professor Angus went on to Mr. J. Schuppan's farm near Wilmington, where manure experiments are being carried out on behalf of the Department. This year the plots as well as the general crops have suffered from the excessive wet. Mr. Schuppan has obtained the best results when there has been a comparatively dry winter with fair later rains. The manure experiments have been conducted over a number of years, and the results generally seem to indicate that bone super. gives the best returns. The average annual rainfall is about 21in. The holding consists of 760 acres, of which about 300 acres are cropped every year. The wheats generally sown are Marshall's No. 3, Federation, Purple Straw, Steinwedel, and Yandilla King, and the average yield is about 14bush. to the acre.

At Caltowie Mr. F. W. Lehmann is conducting experiments with a number of different varieties of wheat, and he is strongly impressed with the value of the experiments as having shown which are the best wheats to grow in the district, namely, Yandilla King and Federation. As a result of these experiments hundreds of bushels of Yandilla King have been distributed for seed. The experiments have also shown the farmers what not to grow; for example, Jonathan and Comeback, which do not yield nearly so well as Yandilla King and Federation.

Mr. Sandow, of Koolunga, also has a high opinion of the value of experiments, and, although the neighboring farmers do not take much interest in his plots, they are content to buy the wheat from the plots in order to secure good, clean seed, and to give more than the market price for it. Mr. Sandow's crops are looking particularly well, especially those of Yandilla King, John Brown, and Jonathan, while his crop of Comeback wheat is one of the finest of this variety that Professor Angus has seen.

THE DEPARTMENT OF AGRICULTURE.

The Annual Report.

The annual report of the Minister of Agriculture was presented to Parliament on the 5th of October, and is now available in printed form. A good deal of the information it contains has already been published in the *Journal*. The following extracts are new :—

(*From the Report of Professor Perkins.*)

IRRIGATION WATER SUPPLY AT ROSEWORTHY AGRICULTURAL COLLEGE.

The extent to which we shall in years to come have to depend for the expansion of national wealth on artificial irrigation is, I believe, beginning gradually to sink into the national consciousness. We have a vast area of territory, as yet but sparsely occupied, and as a community we are almost wholly dependent on what agricultural sources it can supply, and in the nature of things it seems probable that we shall continue to do so through all times. Our future expansion, therefore, may be said to be limited by our ability to continue increasing the sum total of these agricultural resources. Unfortunately, or fortunately, the bulk of our territory is subject to what may be described as arid and semi-arid conditions of climate ; and in present conditions we can expect from these disinherited regions but spasmodic returns—years of plenty almost forgotten in the host of lean ones. Apart from the disputed question of emigration, the natural increase of a fortunately healthy climate imposes upon us the duty of seeing to it that all natural advantages that may have been bestowed upon us are availed of to the full, unless, indeed, we are prepared to see our carefully-reared manhood drift away to create wealth for others. The question, therefore, arises as to whether what is by nature arid and semi-arid must of necessity permanently remain so. As a community it may without invidiousness be said that, notwithstanding the meritorious efforts of individuals, we have hitherto altogether ignored irrigation and its great possibilities to a country such as this. It is to be feared that, such as they are, our ideas on irrigation begin and end with that magnificent waterway, the Murray, albeit even to-day we are very far from realising the vast stores of wealth that lie locked up in its arid banks ; but irrigation can be

practised—on a lesser scale, it is true—wherever rise water-washed steeps, wherever can be sunk a humble well. To the south of Europe, in the north of Africa, over many parts of Asia, there exist many a community eking out its sole wealth from some such source ; and to similar practices we must in the course of time inevitably turn. In the meanwhile is it not right that the rising generation shall have the opportunity of being initiated into the art of handling water to advantage ? Is it not right that we as a community should endeavor to learn, and learn early, all that local conditions can teach us of the possibilities before us ? The Roseworthy Agricultural College is at present admirably fitted, both as to staff and equipment, for any form of agricultural experimental work ; and I hold that what advantages in this direction exist should be availed of to the utmost, and that we should at an early date be put in a position to carry out experimental work that may in later years serve to guide those who will have to depend on irrigation for their living. In the circumstances, too, is it not advisable that every student passing through this institution should leave it with some of the leaven of the irrigationist ?

We are at present, it is true, in connection with the magnificent Barossa reservoir ; but how inadequately, from the point of view of real irrigation, the experience of the past few years has very well shown us. For some time past we have had in hand the by no means simple task of reducing to a suitable grade some 16 acres in the immediate neighborhood of the farm buildings ; our water supply should be sufficient to enable us to place this area adequately under irrigation. If our delivery mains were 4in. pipes instead of 2in. pipes, as is at present the case, I venture to affirm that the work that we should do in the matter of irrigation problems would be of incalculable benefit to the State. By a careful series of regular observations we could undertake to determine the exact quantities of water necessary under definite conditions of temperature to grow successfully the various types of irrigated crops. We could determine by what means water can be applied to best advantage to irrigated crops when the irrigation supply is limited ; we could ascertain what types of irrigated crops are likely to prove most profitable under the conditions open to us ; we could endeavor to find a solution to the “ salt ” question, for already in our irrigated fields “ salt patches ” are making their appearance ; finally, we should have the opportunity of instilling the irrigationist’s instinct into some of the rising generation. As matters stand, however, even with but a few acres under irrigation, we make a fair start in spring ; but as the season progresses have the mortification of seeing the most promising of crops failing us for lack of an adequate irrigation water supply. It is to be hoped that, in the near future, something will be done towards putting us in a position to do something more than dabble in irrigation.

(From the Report of Professor Angus.)

LOXTON EXPERIMENTAL FARM.

That the Loxton country is capable of producing wheat, at least in favorable seasons, will be seen from the statement of last year's crop. The following table gives a summary of the yields of the plots:—

Plot.	Variety.	Preparation of Land.	Acreage.	Bags Wheat.	Yield per Acre (bushel).
1.....	Federation	Fallowed	6.66	74	34.19
2.....	Federation	Unfallowed	13.97	78	17.4
3.....	Gluyas	Unfallowed	12.96	79	18.7
4.....	Comeback	Unfallowed	6.57	25	12.4

Each plot was sown with about 45lbs. seed and 50lbs. superphosphate to the acre, and these results, eminently satisfactory, would indicate that on this class of land fallowing—even the first break of the land—gives a very substantial increase over unfallowing—in this case an increase of 100 per cent. Here, too, of the varieties sown Federation and Gluyas do very much better than Comeback. Samples of each of these were sent to town, and the quality of the grain was first-class. All the Federation and Comeback were sold as seed for the district, as was also the Gluyas, with the exception of a few bags. The Federation seed was supplied from the Parafield Experimental Station, and has been selected for two years.

GRASS AND CLOVER PLOTS.

Work has been continued in the direction of ascertaining the suitability of European grasses and clovers to South Australian conditions. Generally speaking, however, our efforts were only partially successful. One of the chief drawbacks in attempting to acclimatise these grasses and clovers is the prevalence of weeds. On this account the plots at Mount Barker were fed down with sheep, and have now been ploughed up in preparation for an experiment in varieties of imported potatoes. At Saddleworth the same trouble exists, but here several grasses—such as Italian and Perennial Rye, Tall Fescue, Cocksfoot, and Falling Awn—have proved themselves as being suited to the district, and, when well established, stand the hot dry summer remarkably well. The clovers were more or less a failure. At the request of the Tatiara Branch of the Agricultural Bureau a series of plots were laid down with grasses and clovers about two miles south of the township of Bordertown.

PARAFIELD EXPERIMENTAL STATION.

The work at the Parafield Experimental Station continues to make satisfactory progress on the lines laid down in the last two reports. A considerable number of improvements have been made on the place by clearing

and grubbing trees, by the erection of fencing, subdividing the larger paddocks, and by the removal of about 300yds. of road metal from the tracks. This nuisance is gradually being got rid of, and the metal is being put to good account by the district council on their roads.

The harvest returns were not quite so good as last year, although in the plots of selected seed for distribution throughout the State some very good results were got. In this section of the work it is most desirable that the seed should go out clean. Now that these varieties have been under observation for a few years, there is no doubt about their being true to name ; but in handling such a large number of different varieties it is a very difficult matter to keep any one absolutely clean. Consequently a large amount of time had to be put in in going carefully over these plots, and when it is remembered that several of them were three or four acres in extent it will give some idea of the amount of tedious work that has to be undertaken in connection with a station of this nature.

The following varieties were grown for distribution as clean seed :— Yandilla King, $27\frac{1}{2}$ bush. ; Federation (fallow land), $30\frac{1}{2}$ bush. ; Federation (stubble land), $25\frac{1}{2}$ bush. ; Federation (new land), 22bush. ; Marshall's No. 3, 23bush. ; Cumberland, 26bush. ; Pratt's Comeback, $24\frac{1}{2}$ bush. ; Special Comeback, $26\frac{1}{2}$ bush. ; Bobs, 28bush. ; Jonathan, 18bush. ; John Brown, 19bush.

These yields are not so high as last year, but this year's sample was a particularly good one, and those to whom seed was sent spoke very highly of it.

FIXING NEW VARIETIES.

Before a new variety of wheat can be put on the market or sent out for distribution, a very great amount of care has to be exercised in seeing that the variety is fixed—that is to say, that the heads are uniform in type and characteristics. The 28 varieties that were sown last year had to be carefully gone over in order to get them as near true as possible, and consequently the yields could not be recorded. They were not, indeed, at a stage at which any good result could have been got from recording the yields. They have been resown this season, and sufficient seed will be got to make a milling test of them. Moreover, they have been sown in long narrow plots, so as to make the handpicking as effective as possible.

BREEDING PLOTS.

The new crosses effected last year turned out splendid successes, and some very promising results were got from them. They have been carefully classified according to their varying characteristics, and resown in a series of small plots. In all about an acre has been sown with new wheats. The rows

are put in about 2½ ft. apart, and the individual plants in the row about 6 in. apart. The whole of these plots were put in by hand; but their appearance is so satisfactory now as to thoroughly justify the amount of labor that was expended on them. The following is a list of these crosses:—

Crosses on John Brown—Indian No. 1, Indian No. 6.

Federation—Indian No. 3, Indian No. 6, Bobs, Stanley (Canadian wheat).

Comeback—Indian No. 1, Indian No. 3, Indian No. 8, Indian No. 9, Bobs, New Clubhead, Thews, Bunyip, American No. 8.

Yandilla King—Bobs, Stanley, Early Jonathan, Thews, Clubhead.

In addition to these the following crosses were effected:—Stanley and Thews on Dart's Imperial, Stanley on Jonathan, Stanley on Bobs, Indian No. 3 on Bobs.

The question of continuing this crossing work is one which requires grave consideration, as one might go on from year to year getting new crosses and multiplying work to such an extent as to make it unmanageable. Before last harvest, however, a still further number of crosses were effected, as follows:—

On Federation—Gluyas, Clubhead, Jonathan, Indian No. 19, Indian No. 5, Stanley, Hungarian, and Red Fife.

Jonathan—Gluyas, Indian No. 6, Clubhead, Indian No. 7, Indian No. 4, and Stanley.

In addition to these the following were also crossed:—Stanley on Smart's Pioneer, Indian No. 8 on Comeback, Stanley on Early Viking, Manitoban on Early Viking, Preston on Gluyas, Federation on Preston, Federation on Stanley, Stanley on Gamma, Huguenot and Medea on Triumph, Indian No. 5 on Manitoban, Stanley on Bobs, Medea on Gallant, Stanley on Bunyip, Gluyas on Red Fife, Medea on Silver King.

From the above it will be seen that (1) the largest amount of work was done on Federation. This was done on account of the fact of the previous year's crosses being so successful and giving so many very promising heads. (2) A fair number of our hay wheats have been crosses with Huguenot and Medea, with the object of making them more nearly solid in the straw.

Most of the varieties used as the male plants this year were American, Hungarian, and Indian, a very fine collection of which has now been got together on the farm; but another feature of last year's work is the fact that these American wheats have themselves been crossed in several cases by Australian wheats—as, for instance, Gluyas on Red Fife, Federation on Preston and Stanley—and the results of these will, no doubt, be of an interesting nature.

(*From the Dairy Expert's Report.*)

THE DAIRYING INDUSTRY.

It is pleasing to report that the industry is now unquestionably based upon more substantial and sure footing—more so than ever before. This is largely due to the adoption of better methods prevailing amongst our manufacturers, and together with a better understanding now existing between them.

The testing of cream and milk, together with the payment by results, has now become almost universal. This method of purchase is practised, with few exceptions, and those must be classed as decaying concerns. I regret that in isolated cases I have found the most careless management existing. One instance I found the factory was receiving cream and guessing at results. The same factory was fast losing supply, and gave the cause as due to the competition of the Government Factory, which in that instance and in every way has been a blessing to producers. The season 1908-9 under review must be put down as having been a very good one for dairymen, the quantity of butter and cheese produced, perhaps, not being a record; still, supplies were good, and prices ruling for products were highly remunerative. Throughout the State there is every evidence of a better condition of our dairies, stock, &c., and substantial progress has been made. The following shows the number of dairy cows for each year for the last six years:—1903-4, 83,348; 1904-5, 88,156; 1905-6, 93,069; 1906-7, 97,843; 1907-8, 100,743; 1908-9, 106,269. It will be seen that there has been a steady increase in numbers, but the increased number has not led to a corresponding increased production. The breeding of true dairy type has been neglected, also the feeding of the cows for stimulating production.

Strange to say, dairy practice meets with more favor in our Northern areas than in our southern country; in fact, it has been the main source of revenue to many small northerners, who, after a few years, have used it as a stepping-stone to an easier way of making a living by going in for lamb-raising, wool, and wheat. Dairying under such conditions cannot make rapid progress, being resorted to as a means of making revenue when all else fails, and is thus constantly subjected to a severe check. However, where dairy practice is carried on carefully and associated with pig-raising, it will be found that the district is most prosperous, and that the value of land has considerably enhanced. Another reason why the dairy industry does not make much greater progress is explained when I say there is a great need for co-operation. Where we have true co-operation amongst our producers we find greatest prosperity, and where a co-operative factory is under sound management the producer will always secure his full share of the profits from his products. I regret to report that in this State many so-called co-operative factories have failed, but this is due to lack of loyalty of the farmers to their own factory. Many prefer to pass their own factory to accept the temporary inducements offered them by the enemies of co-operation. This, together with the starting

of too many co-operative companies in a district, and fighting of farmers among themselves, has done much to frighten producers from having further to do with co-operative efforts. If producers would only co-operate in the true sense—not fight, but trust and help one another—then, instead of the closing down of factories, there would be a greater expansion of business.

METHODS OF MANUFACTURE.

There has been a marked improvement in this respect; still it is found necessary to constantly point out how to remedy many faults due to utter carelessness. This is in places where often one would least expect to find any necessity. The butter manufacturers are by no means as careful as our cheesemakers; still it must be said of our latter makers that they have not quite equal opportunity for producing first-class quality. This may be explained by the fact that butter-makers are daily receiving, and may be almost compelled to receive, cream of inferior grades. Too great a percentage of the total supply is only second and third grade. Our dairy people are to blame for this condition of affairs, and could very easily remedy it by more careful handling of the cream at their homes, and delivering it earlier to the manufacturers. The quantity of butter which was inspected and graded for export to London totalled 18,205 boxes, or 1,019,480lbs., which was classified as follow:—

1908-9.	Cases.	1907-8.	Cases.
Superfine	2,494	Superfine	2,363
First class	1,025	First	10,818
Second class.....	4,110	Second	8,023
Third class	1,327	Third	981
Pastry class	22	Pastry	2,351
<hr/>		<hr/>	
	<u>18,205</u>		<u>24,536</u>

The grading of all export butters was performed this year in the same manner as last, with the exception that the number of the certificate issued to the shipper was also placed upon the package. As a whole the butters submitted were, generally speaking, of about the same quality as last year; still there was a marked improvement in some brands where I got the manager to exercise greater care in culling out inferior creams. Many of the butters could have been improved very much by an extra working, much of it showing too great a percentage of free moisture. The moisture content could also have been reduced if manufacturers had churned at lower temperature. Considerable variation was evidenced in certain brands. They varied in flavor, color, texture, &c., which points to careless grading and manufacture.

The grading of cream supplies should be more seriously considered by our makers. Unless they adopt grading of the creams we will have a poor

name for our produce ; and it certainly recoils on the good, clean, honest, and careful dairyman, as he is compelled to accept the lower value.

I am perfectly sure, and we have proved it over and over again, that South Australian best butter is equal, and will command equal value, to the best butter in the world, but unless grading is adopted seriously at our factories we cannot hope for highest values. Manufacturers and proprietors of factories should be careful to see to this question of grading before it is too late, when their butter will be neglected in London and low values received. They would do well to note that every year the buyers more and more are buying on the Government certificate. The price between a second grade and first grade is very considerable. It is only a matter of time when the certificates will be demanded, as London buyers realise by this means they are assured of better results.

The grading of dairy produce may be said to have been established primarily as an educative factor to serve mainly the purpose of instruction to manufacturers as to how to remedy errors which were found in consignments forwarded to the port of inspection. This holds as good to-day as ever it did, and I am constantly forwarding instructions to manufacturers during the export season how to remedy faults. It is pleasing to note how anxious managers of the factories are to secure first class certificates for their factory's output ; yet there are a few who are either most careless, or in other words more anxious to please the great percentage of their cream-suppliers, and consequently grade many as first cream which are low-grade seconds.

Manufacturers cannot hope to carry on as was the case a few years back ; buyers are now far more keen to regard the quality. The time is fast passing away when first-class fine-flavored butters will carry the inferior on their back—quality is demanded.

There appears to be a tendency at the commercial end of the business, where inspection is being carried out for quality, first, to be more lenient when the market has an upward tendency ; second, to be more stringent when the market is flat, with a downward tendency.

On a bare market it is always easy to dispose of even a second-grade butter in London at prices ranging within 5s. per cwt. of finest, but it is a very different matter to secure within 10s. to 15s. of tops with second grade on a full market. Few (if any) complaints have ever been heard of when the markets are high, but on a flat market there is always some complaint—flavor fishy, off, &c.

In 1906 our second-rate S.A. butter realised as high as 140s. per cwt., and more keenly sought after, top quotation 145s. to 150s. With the same brand of butter last season sellers found it difficult to quit at 25s. less per cwt. than tops. I mention this to show how necessary it is that grading be compulsory. For would it not follow, if no grading obtained, after a high-priced year such as the above, that it would mean a great temptation on the part of our manu-

facturers to err in regard to quality, and the improved condition of our Australian butters would be hurled back years, to the advantage of our fast-approaching rivals; and I would herein point out that the competition in London, and England as a whole, is becoming keener each year. It is only a matter of a short time when our greatest competition will come from Siberia, which butters are fast meeting with favor in England. Thousands of tons are annually shipped to Copenhagen, and there repacked and sold in England as Danish.

Grading may have many against it; still I am assured of its intrinsic value, which will always obtain, and by so doing it has amply fulfilled the mission for which it was inaugurated.

FAULTS FOUND IN EXPORT BUTTERS.

Faulty flavor may be set down as the greatest weakness found. In this respect the cause was mainly due to the using of inferior creams with the better grades. Many consignments, though creditable in many other respects, had to go into second grade, when the position would have been very different if more careful grading of the cream supply had been insisted upon at the factory. One or two off-flavored cans of cream will suffice to ruin the flavor of a score. The remedy is clear to manufacturers. I also noted that very different qualities of butter were found in the one consignment under the one brand. Repeatedly in drawing cases for inspection from a consignment of butter from one factory I would find one first class and maybe two or more second class. Consequently it only remained to issue a second grade certificate, covering the lot, for which a secondary price would be received, yet contained within the consignment was a considerable quantity of butter which would secure first class certificate if submitted separately.

The texture of the butter generally was satisfactory; still, in this respect the main fault was apparent surplus moisture and greasiness. Greasy texture is the result of churning and working, or exposing the butter to too high a temperature. This can be easily remedied where control of temperature can be had. Much of the trouble is also to be traced back to the farm, where no care oftentimes is given to the cream, and it is the exception to find it cooled down. The cooling down of creams as they leave the separators on our farms would bring about an improvement in texture, flavor, and keeping quality, and if delivered early to our manufacturers would allow of first-class quality being produced.

No factory manager or butter-maker can produce first-class butter from a second grade cream; as the cream is, so will the butter be. I cannot impress manufacturers too much with the importance of fearless grading of the cream supply.

Streakiness.—This is another common fault, and is due mainly to incompetency or carelessness of the maker. It is the result of uneven incorporation

of the salt with the butter. There is no excuse for this kind of thing. It certainly gives the butter an unsightly appearance and lowers its value. The remedy is simple, and only consists of extra working of the butter.

Moist Texture.—I regret to state that there exists a tendency amongst manufacturers to sell a butter containing a higher percentage of moisture than was usual. This is in order to produce a higher overrun, but with such a practice there will surely be complaints from the customers in London. It is often due to excess free moisture that a butter turning the scales at Port Adelaide at 56½lbs. will not weigh 56lbs. in London.

Butters containing more than 14 to 15 per cent. of water will also be found to contain a greater percentage of caseine, which creates a detrimental effect on the keeping qualities. The question of moisture content has been very much discussed in England, and it was due to the presence of excessive moisture which led to the law being made that no butter was to be sold containing more than 16 per cent. This is now the limit allowed. Nor is it fair to consumers that they buy water for butter-fat. It is proving a very serious matter just now for some countries, and if we transgress the same will obtain, viz., that our butters will be publicly stated to contain excessive moisture. Prosecution will follow, with the result that the English retailer will steer shy of Australian butter. Surely there can be nothing he can dread more than to be publicly exposed and prosecuted as selling adulterated food.

Let our Australian butter be found to contain more than the limit and it will have a serious effect on prices, and it will be the dairyfarmer who will suffer. The question of heavy moisture content is receiving the attention of the home and foreign produce exchange, too ; and, further, I would remind manufacturers that the Federal Commerce Act provides for this, and the maxim. water content allowed in superfine butter is 14 per cent., and other butter 16 per cent.

It is my intention this year to institute a more critical examination of export butters, as too many of our butters are sailing too close to the limit. During last season a number of samples were analysed, as I was of opinion the water content was too great. However, on analysis, I found that, though close up, not one exceeded the limit. Still, several lots which were good enough for superfine had to be classed as first class on account of the moisture exceeding 14 per cent. The number of samples on analysis which showed more than 15 per cent. was eight. The highest percentage found was 15·76 per cent. ; the lowest percentage found was 10·00 per cent. The average moisture content in samples of South Australian butter was 13·21 per cent., which I consider very satisfactory ; still, there were many who exceeded this. Any benefit which a manufacturer may obtain by making for high water content will not be lasting, and if generally adopted would have a bad effect in oversea markets. I should recommend producing a butter containing not more than 14 to 15 per cent. This would be most profitable if well made. The man-

facturer who makes a butter containing 10 per cent. of moisture may be said to be wasteful, inasmuch as there is no necessity to come below 12 per cent. to 15 per cent.

There is no data to prove which is the better per cent. to aim at, and there is no reason why butter should not contain 14 per cent., providing that the water used is free from injurious organisms; therefore the production of a dry butter with a lower water content is wasteful to the manufacturer, whilst on the other hand there is no proof that a higher percentage than 14 per cent. is detrimental to the keeping qualities.

Preservatives.—Buttermakers should be careful to see that they do not exceed the limit allowed, viz., $\frac{1}{2}$ per cent., by law in England, and that they use nothing but brands which have proved themselves after exhaustive trials.

Boxes.—Generally speaking, the packages containing butter of first-class and superfine quality were all that could be desired. It is, however, desirable that shippers be more particular regarding the condition of packages, many being very discolored and presenting a filthy appearance, and for which they lose points when grading. There have been no complaints about green timber. Most, if not all, of the cases used were made from well-seasoned New Zealand pine.

Surface of the Butter and Paper.—It is surprising the carelessness that exists with some of our makers. Invariably I find a roughly smeared surface, where a plain fluted wooden roller could be run over the surface, and the packages would present an attractive appearance. The paper, in many instances, is found to be smeared and filthy, and I warn shippers that I shall be very severe with them where I find such gross evidence of carelessness when grading. However, I trust that the factories will remove any further cause for complaint.

MILK AND CREAM CANS.

Throughout the State generally there is a better condition obtaining so far as cleanliness is concerned. However, on inspection I found many dairymen were yet ignorant of the necessity of being clean. Many cans now used for conveyance of cream to factories should be condemned, being rusty and possessing an objectionable odor. Cream or milk should not be received in such cans, and if it is, then it should be paid for at a lower rate. Cream delivered under such conditions will not allow of a first quality keeping butter being made. Directors of factories should support their managers in rigidly enforcing cleanliness in every particular. Cream and milk cans should not be used for carrying whey back to the farms. This is often the cause of an inferior fermentation setting up in the cheese, causing a poor flavor. No cheesemaker should allow this practice, as it will surely affect his milk supply.

CREAMS.

These are delivered at our factories in all conditions of temperature and maturity, but I regret the greater quantity during the summer months is not fit for the manufacture of finest flavored butters. It is high time our dairy people woke up to a high sense of their duty in caring for the milk and cream, and not until they all recognise their responsibility in the manufacture of good butter will we have our improved position.

I know the delay in early delivery cannot be helped in many cases. Still, I must recommend more care, with earlier delivery to the factory. The use of preservatives is not to be recommended. The best preservatives I know of are cleanliness and coolness. If necessary, the addition of a handful of salt will tend to check rapid fermentation, and allow of its delivery in better condition. In this connection it would be well that dairymen so set their cream screw in the separator that the consistency of the cream should be such that it will not take more than $1\frac{3}{4}$ lbs. to 2 lbs. of cream to produce 1 lb. of butter.

MILKING YARDS.

In many instances there was vast room for improvement. However, a better condition is gradually coming. The drainage is often faulty, and lime-washing should be more freely practised. I have again had to complain of the usual house necessities being stored in the same place as the cream. Dairy people should place their cream in a cool, well-ventilated room, away from any possible source of taint, as cream most readily absorbs any foul odors.

FACTORY MACHINERY FOR BUTTER MANUFACTURE.

The newest machine is that known as the combined churner and worker. This machine churns the cream, washes the butter, and works the salt into the butter, thus doing away with the necessity of using a separate machine in the way of butter-worker.

There are several makes; the working is practically the same, but the shape and gearing of the machine is different. I was so impressed with these machines that I arranged to purchase one for use at the Government Butter Factory, but had several improvements put upon it by the maker. There is no labor in emptying these machines. A trunk is either placed under, as in the case of the "Victory," or run in to, as in the case of the "Toplis," which machine is now at Port Adelaide factory.

The saving in labor where these machines are used is considerable, and, after careful inspection and working of the "Toplis," I am satisfied as to the usefulness of such a machine.

CHEESE FACTORIES.

Those visited were found to be kept in a satisfactory condition, and the quality of the cheese as a whole throughout the colony was most creditable,

many of our makes being quite equal to finest New Zealand. However, this being so, it happens that consumers are not, in many instances, able to secure the cheese they favor, viz., a well-matured, mild, clean-flavored cheese. This is due to the fact that many of our factories find it more profitable to sell new and only half-matured curd. Many of our factories would do well to install a very useful machine for agitating the milk and curd. This machine has only been recently installed in many of our modern cheese factories in New Zealand and Australia, and is known as the McEwan milk and curd agitator. It will effect economy in labor, and is most effectual in the handling of the curd, doing it more easily and effectually when compared with the present system of raking and hand-stirring. Further, it will not remove the lining from the bottom of the cheese vats, thus increasing the lifetime of the vats. They are built to suit any sized vats, and are drawn by a pulley from the main shaft, which can be readily put in or out of gear with a lever, and run at any speed required. They are so constructed that any cheesemaker can remove them in a few moments. I would also recommend any of our cheese factories who are contemplating the purchase of a mill to secure the improved New Zealand curd mill. Further, an improvement may be effected at little cost in the curd knives by having three small rollers placed on the bottom end of the knives ; the rollers in which the Alfalfa separator spindle runs are most suitable. By their use makers can cut more uniformly, which is an important matter in securing an even cooking of the curd.

WATER SUPPLY FOR DAIRY COWS.

During the last year it was pleasing to note that a better water supply was available for dairy stock ; the rainfall being a good one was responsible, no doubt, to a large extent. Nevertheless more provision was now being made to ensure better conditions, and even if we were to have a dry season the dairy stock will have improved watering places. Dairymen should give more attention to the water supply. A good water supply is most essential to successful dairy practice, as it plays an important part in the yield and quality of dairy products. In many instances dairy stock are compelled to drink from what might fairly be termed dirty and stagnant waterholes during summer months.

SHELTER FOR DAIRY STOCK.

In this respect our dairying people are very careless, few recognising the benefit which will follow where the dairy cows' comforts are attended to. Not only must more intelligence be put into the breeding and feeding, but the sheltering of our cattle must be seen to, both winter and summer. Where possible, belts of trees and hedges should be grown, and the rugging of cows should be given more attention. The latter can be dispensed with if warm and shady conditions are provided, with rough shelter-sheds, trees, or hedges,

Many corner blocks on our farms could be planted with trees for shelter. They would prove most useful in supplying shelter, firewood, and beautify our farm holdings.

PASTURES FOR DAIRY STOCK.

Dairy people should now be well aware that there is a heavy strain upon the system of a dairy cow worthy of the name, there being a constant wearing away of the animal body, which in its turn is constantly removing valuable plant food from our soils. Even so, I am of opinion that dairy practice is unquestionably the highest soil robber of any branch of agriculture. Nevertheless, it is highly important that more energy be directed to the improvement of our soil and pasture. Under the present conditions of grazing and pastures it cannot be expected that our land can retain its fertility, nor the pasture its nutritive value—pastures being fed bare and never allowed to seed, nor are they ever top-dressed with manures to return food constituents to the soil, which must otherwise become depleted of food for their growth. Farmers should give just as much attention to the manuring and laying down of permanent pasture as they would to the growth of any crop. Where dairy stock are to be kept it is of the utmost importance that special areas be laid down in mixed grass and clover suitable to the district. These will then lessen the necessity for too much hand feeding, which demands increased employment of labor, which in most instances swallows up any returns had under the present half-hearted dairying practice which exists.

ENSILAGE.

Again it would be wise to refer to the great necessity that obtains for the preservation of food supplies for times of scarcity. Ensilage-making is gradually finding favor amongst dairymen; still, this method of conserving fodder is too rarely availed of, and in many districts the most crude notions of its practice appear to prevail. Again, I find that the limited amount of capital at the hands of many dairy people is the bar to their making the necessary provision. Therefore I feel, under such circumstances, compelled to recommend that the erection of silos receive the serious consideration of the Government. Personally, I am not a believer in too much spoon-feeding; still, from what I have seen, I am of opinion that many people who are anxious to conserve are minus the means. I would recommend, therefore, that silos be erected (say one half-dozen) in suitable centres throughout the State, and terms arranged that the farmers agree to pay for them on time payment. When making this suggestion I am doing so knowing full well that many would most willingly avail themselves of the opportunity if offered. By so doing I am convinced that such a movement would be welcomed, and would lead to an appreciable increase in the production of our rural industries, and would be the best means of ensuring our dairy stock against the disease known

commonly as dry bible, which deaths, in my opinion, are due to nothing else but gradual starvation of the system. I would also point out that the conservation of green fodder is one important practice which must be universally adopted in Australia before we are in a position to remove a long-felt necessity, viz., a continuous supply of dairy produce to our oversea customers.

GROWING OF GREEN FOODSTUFFS, ROOT CROPS, &c.

I am pleased to report that more attention is being given to this matter by some dairy people; still, there is vast room for expansion. In too few cases do I find maize, sorghum, millets, &c., being grown for summer feeding, and root crops, mangolds, swedes, which can be grown successfully over a wide area of the State. The same applies to barley, oats, &c., for winter feeding. By attention in this respect not only would dairy folks find when their cattle have been well summered that they will winter well, and when they come into profit very much improved returns will result. It is a most common and pitiable sight to see many good cows just freshened, poor and miserable, and almost totally unfit to fulfil their mission at the bucket. Such cows must prove unprofitable, whereas if well cared for would have proved heavy yielders of butter and have given substantial profits. I am of opinion that dairyfarmers would do well to keep fewer cows and pay more attention to their feeding. Just here I would also highly commend to dairymen the advisability of laying down a few acres, or even a small patch, of lucerne. This, where it can be grown, is unquestionably the king of fodders for milk production, and I am of opinion that it can be successfully grown in many districts throughout the colony where at present it is almost wholly neglected.

GOVERNMENT BUTTER FACTORY.

The supply during the review has been the heaviest since the inception of the factory, and there appears to be every reason to believe that the business will continue to increase. The factory was established purely on account of there being very considerable dissatisfaction expressed by dairymen in every part of the colony, and it was due to their demands that it was erected, as they desired a means of securing a fair and honest check to compare butter contents and quality of their cream. That this factory has justified, and fully and satisfactorily carried out, the mission for which it was inaugurated is most fully shown by the continued and loyal support given it by producers from every portion of the colony; and it is pleasing to report that there are but few who are suffering grievances, and as a matter of policy do not wish to see its usefulness, and more particularly that, although many do not support the Government, they are fully aware of the value and usefulness of such an establishment.

It may be of interest, so I herewith give the figures of the factory up to date, June 30th, 1909 :—

	Pounds of Cream Supplied.	Pounds of Butter Manufactured.	Pounds of Cream to lb. of Butter.	Gross Value.
				£
First Year	479,421	252,327	1.90	11,037
Second Year	949,176	499,981	1.90	23,782
Third Year (to date)	1,222,074	669,344	1.83	31,832

In no instance have we touted or catered for cream from any dairyman in the colony. Personally, I have strongly objected to such a practice ever obtaining, and have strongly instructed to that effect. The figures shown above are very satisfactory, and they are made more so when it is known that the amount of £23,782 does not include £500 which was returned to producers from the profits as a bonus. Further, there is a most substantial profit to report the last year, and these profits are distinctly after due allowance has been made for well paid wages to the workers, full office expenses, and all charges, including interest on capital of plant, buildings, &c.,

The factory has been most successful, and is much appreciated by producers. The business has so increased that it was necessary to erect special and more commodious building, and increased plant. Such will result in the factory being now worked even more economically and with still better results to our producers. The new building and plant will be equal to the most efficient, convenient, and up-to-date factory, not in South Australia only, but in Australasia. A complete pasteurising plant with cooler, together with a combined churn and worker, is being installed, both of which are of the most approved type. The capacity of the factory may be set down as equal to treating, if necessary, 30 tons to 40 tons per week.

OUTLOOK FOR THE FUTURE.

The prospects are very bright, and I am of opinion that at all times there is no State wherein a better average price is paid for the material than in South Australia—that is, for well-cared-for milk or cream. The expansion of the industry will depend much upon the care which is exercised by our dairy people in first breeding, feeding, and selection of good dairy stock. Breeding on better lines and feeding only those found profitable, after they have been fairly treated and their value arrived at with the scales and Babcock tester.

There are, therefore, three essential considerations in respect to the improvement of our dairying business—better breeding, feeding, culling, and management. These alone will assure the progress of the industry. Dairymen can, I think, look for remunerative values for their products during the coming year, both in local and oversea markets. Still, the profits they make will

much depend upon the cost of production and condition of their produce when marketed. Competition, I feel sure, will become keener during the next few years. The butter supplies of Siberia are becoming very heavy, with an improved quality; and after many years' warning, it points to their being our greatest competitors in the English market. They have advantages over us in Australia in labor, &c., but we have many conditions which counter-balance. Still, greater care is essential in the management of the raw material in Australia at the farms, and if we manufacture good, clean-flavored products they will always find an unlimited demand. The industry here is upon a sounder basis, transit conditions are better, and we have good work being done by our Commercial Agent. These, coupled with the fact that trade conditions are good, I see no reason, if sound produce is shipped, why the future should not prove one of the brightest for producers.

(*From the Report of Chief Inspector of Stock.*)

SHEEP.

During the past year the health of the flocks has been good, and no serious epizootic disease has visited the State, but a good many sheep have been lost by troubles that, unfortunately, are always with us, such as lung and intestinal worms, tetanus, stinkwort poisoning, ophthalmia, poison plants, cuckoo scab, and poverty.

Worms.—Lung and intestinal worms have been only too prevalent in the South-East, and in a few flocks near the Murray, and in the Lower North. The South-Eastern Inspector of Stock reports the use of inter-tracheal injection of turpentine and oil for lung worm as being of great service. Many owners neglect to provide licks, which are so necessary to health of sheep, especially in the South-East. Salt and iron are indispensable; and if a little turpentine is added to the lick it becomes a most valuable vermifuge; but turpentine must be used in very small quantities at first, or the sheep will not touch the lick. Mr. Riddoch, one of our most experienced stockholders, strongly recommends the use of turpentine; and by gradually increasing the quantity of turpentine in the lick the sheep will acquire the taste, take considerable quantities, and thrive well.

Tick and Lice.—It is regrettable to have to report that tick and lice are again prevalent, especially in the coast districts. The inspectors had great trouble in enforcing the dipping of vermin-infested flocks, and complain of the still frequent use of useless, non-poisonous dipping preparations that will not destroy lice or ticks. In common fairness, however, it must be stated that the owners of the majority of the great proprietary dips plainly state in their advertising pamphlets that their non-poisonous preparations are not intended and are useless for the destruction of lice and ticks; but still foolish or prejudiced persons will continue to use them, to the detriment of their own and their neighbours' flocks.

Wild Dogs and Foxes.—Wild dogs are again reported to have caused great loss, and especially in the Far North. The Deputy Chief Inspector reports that foxes are rapidly increasing in the Central and Northern districts, and are becoming a serious pest to the farmers. The fox has come to stay, and the rapidity with which reynard is increasing is simply appalling. He is all over the farming areas, and has taken kindly to the Far North, with all its drawbacks. Fortunately a fox will take a bait much more readily than a wild dog, and now fox skins are so valuable many, no doubt, will be poisoned. There is much to be learned, however, even in poisoning and laying baits. On a recent journey in the North I found that it had been discovered by some cunning men in the ranges, where foxes were very troublesome and numerous, that they were very fond of sardines. The method of poisoning adopted was to mix carbonate of soda with strychnine, put a small quantity of the poison on a sardine, without handling the bait, and use a trail when laying the baits. I was assured that by using this method the foxes not only readily took the baits, but were found, which does not very often happen, dead close to, and the men were able to get the skins. This method of poisoning has since been tried by farmers on the plains immediately north of Adelaide, I am told, with complete success.

Losses from Poisonous Plants.—There have not been many reports of losses from noxious weeds, but a heavy loss was experienced in a large flock of travelling sheep on the Murray. As usual numbers of pregnant ewes have been lost from stinkwort-poisoning. Stinkwort in flower has a very toxic effect on ewes in lamb, which should be kept off stinkwort country as much as possible.

The Lambing.—The lambing has been very disappointing, owing to green feed coming so late in the season. Though there are many individual cases of high averages in favored districts, the general average for the whole State will be very low—probably under 70 per cent. However, though so many of the early lambs were lost, the later droppings were good, both ewes and lambs being strong, and the feed plentiful.

Wool.—Again South Australian woolgrowers can look back on another good wool season. The clip, though lighter than usual, was in perfectly sound condition, the length of staple very marked, and less burr and seed than for some time past; and it is good to note the gradual improvement in our farmers' wool. The brightness and freedom from tick of the Port Lincoln wool was generally remarked. The number of bales offered at the Adelaide wool sales was 141,562, and the number sold 134,705, showing an increase as compared with last year's sales of 12,454 offered and 14,271 sold.

CATTLE.

The number of cattle in South Australia, according to the latest returns available, are as follows:—340,376, namely, 106,269 dairy cattle and 234,107

other cattle, showing an increase, as compared with the previous year, of 5,705—namely, dairy cattle, 5,526 ; and other cattle, 179.

Pleuro-Pneumonia.—I am glad to be able to report the almost entire freedom of our herds in South Australia from pleuro-pneumonia during the past year. For many years past the staff have inoculated all herds and travelling droves of store cattle in which the disease appeared with most gratifying results, and have patiently pointed out to stockowners the value of inoculation as a preventive of the disease ; and our present comparative freedom from this dreaded disease is in a great measure due to the fact that a great many of the cattle-owners—particularly in the north of this State, the Northern Territory, and Western Queensland, where we obtain so many cattle—are now inoculating whenever virus can be obtained. The energetic work done by one stockowner—namely, Mr. Sidney Kidman—has been of great value to the State. This gentleman, since he became convinced of the value of inoculation, has not only inoculated his own herds, but immense numbers of cattle for other owners, and set a notable example, and clearly demonstrated the great value of inoculation. The principal cause by which this disease is perpetuated amongst our cattle is undoubtedly the so-called recovered beast. In many of these so-called recoveries the diseased portion of lung becomes encysted, nature throws a wall around it, and for a time—it may be twelve months, two years, or perhaps longer—the animal appears to thrive, but eventually the wall of the encystment breaks down, and the disease again becomes active and spreads through the herd. It is false economy to keep these recovered beasts in a herd. All cattle showing the symptoms of the disease should be destroyed, and the rest of the herd or drove inoculated as soon as possible. Though more than 15,000 head of cattle were slaughtered during the past year at the city slaughterhouse only one beast was condemned for pleuro-pneumonia.

Tuberculosis.—A determined effort has been made by the staff to keep this dangerous disease in check, and I am glad to be able to state that we have had great help from owners of cattle, who are reporting cases of disease much more freely than in the past. There has been a slight increase in the number of cases of tuberculosis dealt with—namely, 240, as compared with 206 last year ; and of this number 95 were dairy and 145 other cattle ; 223 were destroyed, 7 died, and 10 were isolated for further examination.

Paralysis or "Dry Bible."—Three hundred and fifty-six head of cattle were found by, or reported to, the staff suffering from paralysis, or so-called "dry bible," during the past year, showing an increase of 47 over the previous year. Of this number 259 were dairy and 97 other cattle ; 299 died and 57 recovered under treatment, and no doubt a good many cases were not reported. All the evidence we now possess points to a deficiency of phosphate in the food as the principal, if not the sole, cause of this disease. The experiments carried on in this State and in South Africa in the past have clearly shown that a liberal supply of phosphate,

in the form of grain or bonemeal, is an effective preventive of the disease. Many of our experienced cattle-owners in this State have, by intelligently dealing with the food and water supply of their cattle and supplying the ingredients nutritive demands for the proper nourishment of their stock, prevented the recurrence of the disease.

Actinomycosis.—Eighty-nine cases were dealt with—namely, 42 dairy cattle and 47 other cattle; 64 were destroyed, and 25 were isolated for fattening or for treatment.

Cancer.—Thirty-six malignant cases of cancer were dealt with by the staff, and were all destroyed.

Yacka-poisoning.—A great many cattle have been lost during the past year from turning them into burnt yacka country. The green yacka shoots which sprout after a fire have a very toxic effect on cattle, and owners should be more careful. Fortunately most of the stockowners in the South-Eastern and Southern districts are aware of the danger, but it is feared that many of the cases that have been looked upon as “dry bible” in the Port Lincoln and other districts were really yacka-poisoning.

CAMELS.

The number of camels inspected during the past year was 1,948. The Northern Inspector reports “that owing to the prevalence of camel mange, and carelessness of owners, it became necessary to establish a quarantine near Port Augusta West, and 61 camels belonging to various owners were seized, quarantined, and dressed, the cleansing process being prolonged owing to the absence of green feed. All these camels have now been released clean.” A number of camels were also yarded and dressed for mange at Hergott and Farina. Altogether 343 camels were found suffering from mange (scabies), and were dressed under supervision; 3 died and 340 recovered. The number of camels in the State by the last returns was 3,051, inclusive of 235 in the Northern Territory.

HORSES.

The number of horses in the State, according to the latest returns, was 213,385, showing an increase, as compared with the previous year, of 4,746. Influenza (pink eye) in a very mild form visited the State, attacked most of the horses in the Metropolitan District, and beyond temporarily inconveniencing horseowners did very little harm, and very few died. Subsequently the disease spread into the farming areas, and caused much inconvenience at the busy time of the year, and many horses were lost from pneumonia and the usual sequelæ, as many owners were unable to spell their horses when suffering from attacks of the disease. Two outbreaks of anthrax occurred on two farms near Wallaroo; quarantines were declared, and the stock on the farms vaccinated with anthrax vaccine, with satisfactory results, and both farms will soon be released. This outbreak, there is little doubt, was caused by the illegal introduction into the State of unsterilised blood and bone

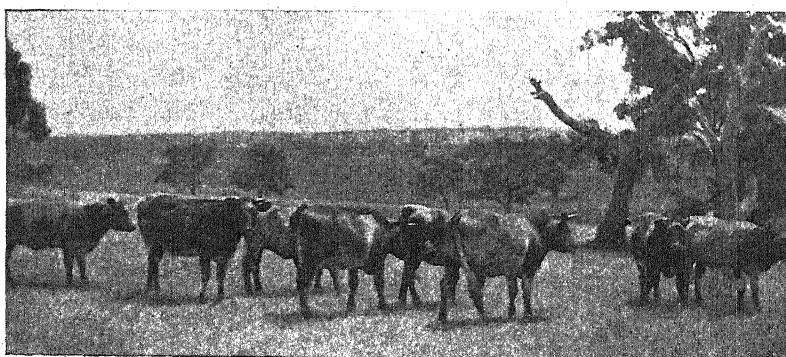
manures. Another source of uneasiness is the increasing prevalence of tetanus in our horse stock, and it is feared that a good deal of carelessness leads up to many of the shocking cases seen by the inspectors during the past year. Yards and stables should be kept as clean as possible, and wounds and sores on our horses should be attended to at once, kept clean, and a good antiseptic dressing used. It must be remembered that the germ of this disease gets into the wounds and sores with the dirt. Anti-tetanic serum treatment has been tried, but the results were not satisfactory.

SWINE.

The latest returns show another serious falling off in the number of pigs in the State. According to the latest returns the number of swine was 78,454, showing a decrease, as compared with the previous year, of 12,287. I am glad to be able to report, however, a marked improvement in the health of swine in the Metropolitan District (Quarantine District No. 2), a freedom from swine fever, which is most encouraging; and it is hoped that in the near future it will be possible and compatible with the safety of the pig industry to remove the restrictions on the movement of swine and release Quarantine District No. 2.

Having in view, however, the extreme difficulty there is in eradicating swine fever, and the highly contagious and insidious nature of the disease, the fact that the authorities in Great Britain have failed to stamp out the disease, and that swine fever still exists in Victoria and New South Wales in spite of the determined efforts that have been made, it is proposed still to maintain a strict supervision of the pig market and piggeries. The condition of the pigs and piggeries has been much improved since the outbreak of swine fever. More attention is paid to the class of pig bred, and many insanitary piggeries have been destroyed, but much remains to be done. Insanitary piggeries still exist, which are a menace to the pig industry, and should be condemned under the Health Act.

The practice of hosing pigs in the Adelaide pig market, especially in the cold weather, is a prolific source of disease, and should be stopped.



ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, November 10th, at Roseworthy Agricultural College, there being present Messrs. J. W. Sandford (chair), G. R. Laffer, C. J. Tuckwell, J. Miller, C. J. Valentine, A. M. Dawkins, and Professor Perkins.

This meeting was held on the occasion of the annual visit of the Board to Roseworthy College Farm. Professor Perkins conducted members round the farm. A fine field of Cape barley, going about 50bush. to the acre, was pointed out (says the *Register*) on land that had previously borne a crop of turnips. Passing by a small paddock Professor Perkins pointed out several sheep as an object lesson against dipping too soon after coming off the machine shears. The machines, it was explained, leave in a few instances small cuts which are almost invisible, and the dip had caused blood poisoning. Several sheep had been lost from that cause, and the ones above noted were just recovering from illness. In future it was intended, in order to obviate trouble, not to dip till a month after shearing. Two fine irrigated plots of lucerne attracted attention. A healthy-looking patch two years old had been cut last year seven times. The other one, sown last April, had already had one cut taken off, and had only been watered once since; but it was more than 1ft. high and in splendid condition. Next a 23-acre plot was passed, in which long lines of bare stalks and wild oats called for explanation. This land had been planted with thousand-headed kail. Nearly 600 lambs had fed in the enclosure for five or six weeks. They had stripped the plants, which, however, would grow again and would be once more fed off. Mr. Miller remarked that when the College was first opened that land would not carry 600 sheep on 200 acres. A mixed crop of oats, wheat, vetches, and lucerne, going nearly 4 tons to the acre, was next examined. In reply to an inquiry, Professor Perkins said he advocated the sowing of lucerne in autumn. Weeds would come up with it, but they would protect the succulent fodder during the winter, and when the cut was taken off the lucerne would grow clean. If the autumn crop failed—which was unlikely—there would be opportunity to sow the lucerne again in the spring. The general wheat crops on the farm, which before the late hot winds and rain had promised 26bush., were not now expected to average more than about 20bush. Many plots had been beaten down as though a roller had been over them.

The visitors made a close inspection of the experimental grass plots, where many well-known varieties and anything new that comes to hand is given a trial and made to contribute to the education of the agricultural students.

A particularly favorable impression was produced by a bed of Spanish sainfoin, which was 2ft. high and in flower, and had been grown without water. Among other grasses which received favorable comment were the King's Island melilotus (*Melilotus indica*) and veldt grass, and a tall, coarse-looking plant (*Medea sativa*) was indicated as one for which cattle had a great partiality.

An instructive section in the permanent experiment field was that of the rotation crops grown with and without manure. The party was impressed with the benefit of the rotation system, and was informed that in five years wheat grown after a summer crop had only yielded a less total by 5bush. or 6bush. than wheat after bare fallow; while wheat after a winter crop showed little difference in comparison with wheat after bare fallow. One good plot was shown carrying its fourth wheat crop in five years, the last year having been bare fallow.

The experimental wheat strips proved an educative feature. In the work of proving types, hybridising, and improving by selective breeding and other forms of experimental work are carried on with an amazing patient labor and careful book-keeping that reflect great credit on the staff and the students. The French wheats, which came to South Australia with the reputation of being heavy yielders, were said to be too late for this state, but it was hoped that after acclimatisation and attention it would be possible to make them ripen earlier. Hybrid Champlain was pointed out as the most promising variety in the section. In the hand-crossed grains the Delta Squarehead was the best yielding barley on the College Farm. King's White wheat was better than King's Early or King's Red; but the best selection from King's stock was that booked as Lambda, and was a type that was now pretty well fixed. The College Eclipse was noted as a considerable improvement on Carmichael's Eclipse, from which it had been bred. A depth test proved highly instructive. It had been carried out for three years to ascertain what was the best depth for the grain to be planted. Experience right through had shown that 3in. was not too deep, and a good percentage of the grain had germinated at even 6in. Experimental plots of 100 to the acre demonstrated the value of feeding down oats. A number of varieties planted side by side had not been cut; beyond these in each case were three plots from which cuts had been taken on different dates, it being impracticable to put sheep into them. The best results had been shown with Calcutta and Algerian oats, the cut crops having grown quite as strongly or more strongly than those that had not been interfered with.

The competition pens of poultry and the laboratory and other facilities for students were inspected. Professor Perkins exhibited a pretty transformation where an old dam had been converted into a lagoon with a central islet of veldt grass. The margin had been planted with basket willows,

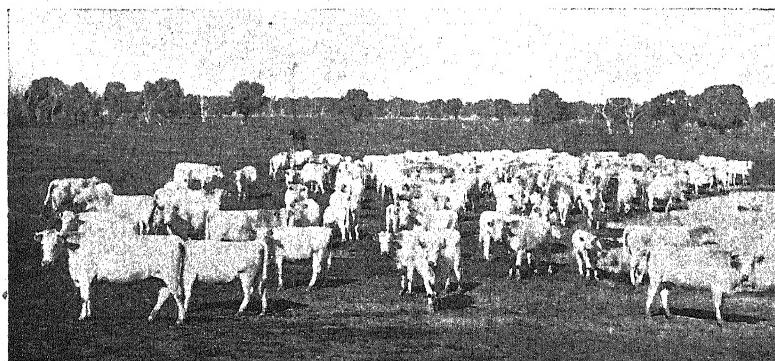
and between the water and concentric rows of shade trees Kentucky blue grass and white clover, with the aid of a topping of white sand, had converted the clayey rim of the lagoon into a comfortable green lawn. The visitors lunched at the College, and were entertained at afternoon tea by Mrs. Perkins.

A request was received from the Port Elliot Branch to consider whether black and white magpies should not be removed from the list of protected birds. On the motion of Mr. Dawkins it was decided to inform the Branch that the board is in favor of the strongest possible protection being afforded these birds on account of the great amount of good they do.

Advice was received from the Secretary to the Minister of Agriculture that the Minister intended to introduce a Bill to effect the compulsory examination of stallions.

The formation of a Branch at Hookina, with the following gentlemen as members, was approved :—Messrs. A. J. and W. P. Henschke, S. and F. Stone, J. H. Gloede, P. Murphy, P. Kelly, L. and M. B. Woods, B. Sheridan, J. Henschke, jun., T. O'Connor, and D. E. Madigan.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. E. Hutchings, J. Tyner, W. Hill, C. Godely, J. Godely, and W. G. Hender, Keith ; G. A. Goodes, Caltowie ; J. Trainor and J. Tren-grove, Bute ; H. Furnis, G. and F. Weidenhofer, W. J. Mitchell, H. Traeger, M. Jones, J. Featherstone, jun., and A. Abbott, Geranium ; H. Primer, F. Bailey, J. West, and F. Wilkins, Wild Horse Plains ; E. E. Smith, A. Philpot, and R. Pannon, Renmark ; A. P. Sowerby, Parrakie ; V. Spencer, Clarendon ; W. J. Pyman, A. E. Feineler, and J. Palin, Hawker ; T. C. Simpson, Port Pirie ; W. Osborne and F. Nottage, Meadows ; L. Napper and G. Carter, Johnburg ; C. H. Bath, Brinkworth ; T. J. Slee, Mount Remarkable ; G. and V. Gordon, H. Proctor, and M. Dollard, Shannon ; and E. Brice, Coomooroo.



HERD OF WHITE CATTLE.

THE PARAFIELD EXPERIMENTAL FARM.

Visit of the Advisory Board.

On Wednesday, November 17th, the Advisory Board of Agriculture visited the Parafield Experimental Farm. The following members were present:—Mr. J. W. Sandford (chairman), Professor Perkins, and Messrs. J. Miller, G. R. Laffer, C. J. Valentine, R. J. Needham, C. Willcox, Colonel Rowell, C.B., and G. G. Nicholls (acting secretary).

The Board was received by Professor Angus (Director of Agriculture) and Mr. A. E. V. Richardson (Assistant Director), who has been appointed Superintendent of the Farm. The whole of the wheats were inspected, the first visited being the selection plots. The value of fallowing was apparent on plot No. 1, where a mixture of White Tuscan and Gallant wheats was sown for hay. The unfallowed portion was choked with weeds, whilst the fallowed section of the plot was quite free and remarkably uniform in size. The following varieties have been sown in the selection plots in acre blocks to obtain, by careful selection, perfectly clean seed wheat true to name, namely:—White Tuscan, Bunyip, Gluyas, Baroota Wonder, Correll's No. 7, Comeback, Federation, Yandilla King, Marshall's No. 3, Triumph, Cumberland, American No. 8, Huguenot, and Medeah. Of these it was noticeable that Bunyip and Cumberland were most forward, and nearly ready to reap. Two very fine crops of specially selected Comeback and Federation were examined. Comeback has the reputation of being a bad yielder in some districts, though its high quality as a milling wheat is undisputed. A two and a half acre plot of this variety, specially selected, looked as likely a "bagfiller" as any on the farm. Several striking hay plots were examined, the most conspicuous being Medeah and Huguenot, the former averaging 6ft. 6in. in height and the latter nearly 6ft.

THIRD-YEAR CROSSBRED WHEATS.

The third-year crossbred plots commanded a good deal of attention. There were 28 of these as yet unfixed, many of them being the unfixed crosses raised by the late Mr. Farrer, of New South Wales, and several of them showed promise of being superior grain yielders.

BREEDING PLOTS.

The breeding plots were of absorbing interest. Here the object for which the farm was established was apparent, viz., to raise varieties of wheat true to name, and clean, and also to improve existing standard varieties by cross-breeding and selection. A large number of small hand plots, containing the

standard varieties, and wheat from the principal wheat-growing countries of the world were sown in rows. Prominent amongst these were the Canadian, American, Argentine, Russian, Hungarian, and Indian wheats. These last named have been specially useful in cross-breeding on account of their remarkable earliness and resistance to fungoid diseases. They are the last sown, and are invariably the first to ripen. These have been crossed on our South Australian standard wheats with the object of promoting earliness and immunity from disease.

SECOND-YEAR CROSSED PLOTS.

Some time was spent in examining the second-year crossbred plots. The effect of crossing is invariably to *break the type*, i.e., to cause the plant to vary. All shades of variation from the male plant on the one hand and the female on the other are apparent. The great art of the breeder is to seize on the variation which is most likely to be of service and to endeavor to fix it, i.e., to breed it true to type. Conspicuous amongst crosses that seemed likely to give encouraging results were the Indian wheats on Federation, John Brown, and Comeback; and also American No. 8, Bunyip, Bobs, and Club-head on Comeback. A particularly fine cross was Bobs on Yandilla King, which gave heads of exceptional size and compactness, some of them being fully 9in. long and densely packed. The visitors expressed surprise at the great improvement that had been effected by cross-breeding in length, compactness, and quality of heads.

BUNT TESTS.

An effort has been made to determine the best fungicides for preventing stinking smut in wheat. Two varieties, Federation and Comeback, have been used in the tests. In each case a set of experiments with different strengths of bluestone, formalin, and fungisine has been made. The plots were not sufficiently advanced to decide just yet as to the respective merits of these fungicides, but the results will be published in due course.

Before returning home the visitors were entertained at afternoon tea by Mrs. Richardson.



THE PHYLLOXERA BOARD.

The Chief Inspector of Vineyards (Mr. Henry Lowcay) has presented his annual report to the Phylloxera Board of South Australia. He says—"The ninth year of the inspection of vineyards has come to a close, and it is my pleasant duty once more to report that the vineyards of this State are still so far free from the invasion of the dreaded pest, *Phylloxera vastatrix*, and heartily congratulate the vignerons and vinegrowers generally on this most satisfactory state of things. Owing to a somewhat late spring I did not consider it wise to commence operations till the last days of October, and then continued inspecting up to the end of April of the present year. Last year 7,500 acres of vines were inspected, and this season 6,950 acres. The great range of country which had to be traversed this time as well as the long distances and out-of-the-way places where numbers of vineyards are planted accounts for the difference in acreage. During the previous inspection in the Barossa and neighboring districts, where the vineyards are close together and easy of access, considerably less time was spent in travelling.

"The following localities were inspected in the order they were taken :— Started in an unfinished portion of Lyndoch, thence through Rosenthal, Sandy Creek, Gawler River, Kangaroo Flat, Willaston. Then in the South, Morphett Vale and Hackham, afterwards proceeding to South-East, inspecting all the vineyards of Coonawarra Fruit Colony and small gardens in and around Penola, as far as Yallum Park. On the way back I broke journey at Bordertown, where there is a vineyard of six acres in excellent condition ; also a small, neglected three-quarter acre a distance from township. Proceeded then to Langhorne's Creek via Strathalbyn. During the past three or four years a good deal of planting has been undertaken along the wonderfully fertile banks of the creek. At the present time there are at Langhorne's Creek 130 acres of Zante currants and 210 acres of wine grapes. Further increases are contemplated. The next centres visited were Hamley Bridge, Riverton, Undalya, Auburn, Watervale, Hughes Park, Emu Flats, the whole of Clare, including Sevenhills, Bumburnie, Stanley Flats (now an important Zante currant centre), White Hut, Hill's River (including all outlying vineyards). Then I turned my attention to the Tea-tree Gully district, Highercombe, Highbury, Onetree Hill, Golden Grove, Modbury, Hope Valley, Athelstone, Paradise Park, Hectorville, Felixstowe, Marden, and Hamilton, and finished the campaign around Brighton and the circle towards Marion, where the next inspection should commence. During my stay in the Clare district I took a careful census of the acreage of all the Zante currant vineyards,

including the most recently planted portions, and was afterwards able to draw up a reliable and up-to-date list of the currant vineyards of the State, giving the acreage of each district for the years 1902, 1905, 1909. From information received to date (September, 1909) I gather that approximately 390 acres have been planted this winter, which, added to the 2,885 acres, will raise the actual acreage in South Australia to 3,275 acres of Zante currants.

"On the whole I found the vineyards in much-improved condition, and better cultivated than was the case a few years back. This is doubtless owing to the more remunerative prices which the vinegrowers are now obtaining for their grapes. There is a tendency in most vine centres, with the exception, however, of the South-East and the country around Onetree Hill, to extend the wine-producing vineyards, and a number of new ones would already have been planted if suitable rooted varieties had been obtainable. Vine-growers generally are seriously thinking of manuring their vineyards in a judicious and systematic manner, for they realise that unless this is done they cannot depend on even and payable crops. Last year I had to suspend operations several times to go at the request of growers to examine various vines suspected of being diseased, but this season only one vinegrower claimed my attention in that way. Just before starting my inspections I was requested to go and examine some vines at Nuriootpa near the distillery. Happily there was nothing serious, a few Tokay vines suffering from excess of moisture, and the roots decaying through defective drainage.

"With regard to the importation of plants by rail and boat, their number has steadily decreased from year to year, and is now, through constant watching, reduced to a minimum. The certificate which is exacted for all trees, bulbs, &c., has proved most effective in every sense. When in the South-East last December I heard that plants and fruit trees still at times were introduced surreptitiously across the border, but measures have been taken to stop this dangerous practice."

Mr. Lowcay gives the following acreage of Zante currant vineyards in South Australia :—

Districts.	Jan., 1902. Acres.	Jan., 1905. Acres.	Jan., 1909. Acres.
Clare	109 $\frac{1}{2}$	366	846
Angaston	95	378	820
McLaren Vale.....	110	367	478
Watervale, Auburn.....	65	114	135
Langhorne's Creek.....	20	27	129
Remark and River Settlements, includ- ing New Era	30	182	427
Small vineyards	15	25	50
	<hr/> $444 \frac{1}{2}$	<hr/> 1,459	<hr/> 2,885

About 3 per cent. not in bearing.

Statement of Receipts and Expenditure for Twelve Months ending June 30th, 1909.

Receipts.		Expenditure.	
Dr.	£ s. d.	Cr.	£ s. d.
To balance from last account ..	5,503 16 7	By expenses of the board	460 17 4
Treasury bills .. £5,300 0 0		Secretary's salary £78 4 3	
Cash in hands of		Inspector's salary 182 19 0	
Treasurer .. 135 10 10		General expenses 57 4 1	
Cash in Bank of		Travelling ex-	
N.S. Wales .. 65 0 7		penses 117 11 6	
Cash in hands of		Advertising, print-	
Secretary .. 3 5 2		ing, and sta-	
To Rates account, 1908-9 —		tionery 25 7 6	
Collected by Commissioner		By Commissioner of Taxes —	
of Taxes under clause 20		Expenses collect-	
of Phylloxera Act, No. 724,		ing rates, clerical	
of 1899. 1,221 13 10		assistance, &c. 60 0 0	
To interest on Treasury bills ..	186 18 6	By balance	6,391 11 7
		Treasury bills .. £6,100 0 0	
		Cash in hands of	
		Treasurer .. 284 0 5	
		Cash in Bank of	
		N.S. Wales .. 4 17 8	
		Cash in hands of	
		Secretary .. 2 13 6	
	£6,912 8 11		£6,912 8 11

Balance-sheet for Twelve Months ending June 30th, 1909.

Liabilities.	Assets.
£ s. d.	£ s. d.
Revenue expenditure account—	
Balance at credit of this	Treasury bills—
account 6,559 19 4	Amount invested by board .. 6,100 0 0
	S A. Government—
	Balance of rates, &c., in hands
	of Treasurer 284 0 5
	Sundry debtors—
	Uncollected rates 108 7 9
	Bank of New South Wales—
	Balance of current account .. 4 17 8
	Cash in hands of Secretary 2 13 6
£6,559 19 4	£6,559 19 4

J. G. KELLY, Acting Chairman.

W.M. GEORGE AULD, Secretary.

I have examined the above balance-sheet and compared the same with the books and vouchers presented, and certify the same to be a full and fair balance-sheet, exhibiting a true position of the Board's affairs on the 30th June, 1909.

W. M. S. KEKWICK, A.I.A., S.A., Auditor.

Adelaide, July 24th, 1909.

THE WHEAT MARKET.

Seldom, if ever, has the price of wheat remained stationary in South Australia for so long a period as it did from the 10th of August to the 10th November. When a change in the quotation was made there were some interesting developments. On the 11th of November the price for old season's wheat fell from 4s. 6d. to 4s. 2d., with no alteration for new season's wheat. On the 17th there was a further reduction of 2d. in the price for old wheat. At the same time the price for new season's wheat, December delivery, was raised to 4s., but for January delivery it was kept at 3s. 10d. One firm explained the drop from 4s. 6d. to 4s. 2d. by saying that it was due to so many flour mills having shut down in the other States on account of the shortage of coal. On November 26th one price was quoted, namely 4s., for old season's and new season's wheat, December or January delivery; but subsequently the daily papers reported a slight range in the quotations, namely, from 4s. to 4s. $\frac{1}{2}$ d., and later on from 3s. 11 $\frac{1}{2}$ d. to 4s. $\frac{1}{2}$ d. One of the papers reports that the higher price is given in a few instances "owing to local conditions," but it is understood that some of the merchants who were previously guided by the "honorable understanding" are now fixing their prices independently of that body.

On October 8th *Beerbohm's Evening Corn Trade List*, after reviewing the wheat position, concluded an article as follows:—

The probabilities are, according to revised estimates, that the present season will prove to be the third in succession in which there has been a keen struggle between supply and demand, with resulting high prices. All this points to the conclusion that the latter portion of the present season may easily witness much higher prices than those now current.

In later issues the same paper was not so optimistic, the estimates of supplies having been disturbed by the continued heavy shipments from Russia. Considerable speculation has taken place respecting the probable exports from Argentina. At one time it was anticipated that there would be a considerable reduction on last year's shipments, but later reports state that the exports will probably be as heavy as last year. Although the Buenos Ayres correspondent of the *Pastoralists' Review* wrote so long ago as the 10th of September, his letter on the wheat position seems to bear out those who take the view that the Argentine exports of this year will not exceed 10,000,000 quarters:—

Only last week did the persistent drought in the south and south-west come to an end—too late altogether to save the situation in so far as wheat and oats are concerned. There are writers who would have us believe that all is now well, and that the Argentine surplus of wheat, linseed, and oats from new crops will be quite equal to the last harvest. They must be optimists of the first degree to believe such a thing. Latest news about the locusts is not encouraging. A good deal has been heard of the reorganised defence department. The new honorary commissioners are men of accepted standing in high commercial circles. They have at their head Mr. Juan Ortiz de Rozas, jun., who has given up the permanent secretaryship of the agricultural office to take the presidency of the Locust Defence Department. At the first meeting of the new body the inspector-general gave them a rather gloomy report. In brief, he expects the invasion this year to be of the greatest density yet experienced. His fears look very much like coming to be realised. From all parts of Cordoba, Sante Fe, and Entre Rios the cry is the same—locusts (flyers) everywhere, and in some cases hatching-out has already begun; hence locust damages must form a big item in the damages list to Argentine cereals. We have still to go through the frost and hailstorm season.

Date.	LONDON (Previous Day).		PORTADELAIDE.		MELBOURNE.		SYDNEY, Per Bushel.
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	
Nov. 4	Dull and neglected ..	..	4/6; 3/10 (n.s.) ..	..	..	4/6½ (b.) ; 4/7 (s.)	3/10 to 3/11 (n.s., b.)
5	J. & F. 4/7½ (s.) ..	..	4/6; 3/10 (n.s.) ..	..	..	4/7 ..	3/10 (n.s.)
6	January, 4/7½ ..	..	4/6; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
8	— ..	..	4/6; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
9	Steady ..	..	4/6; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
10	Steady; quiet ..	..	4/6; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
11	Firmly held ..	..	4/2; 3/10 (n.s.) ..	..	..	4/7 ..	..
12	Steady; quiet ..	..	4/2; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
13	Quiet ..	..	4/2; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
15	— ..	..	4/2; 3/10 (n.s.) ..	..	..	4/6½ ..	..
16	Quiet ..	..	4/2; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 ..	..
17	Steady; quiet ..	..	4/2; 3/10 (n.s.) ..	..	..	4/6½ to 4/7 (nom.)	..
18	Firm; quiet ..	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/6½ to 4/7 ..	..
19	Quiet ..	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/6½ to 4/7 ..	..
20	October, 5/1½ net; afloat, 5/1½	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/6½ to 4/7 ..	..
22	— ..	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/6½ and 4/5½ ..	..
23	Firm; quiet ..	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/5½ and 4/5½ ..	..
24	Firmly held, inactive ..	..	4/-; Dec., 4/-; Jan., 3/10 ..	..	..	4/5½ to 4/6 ..	..
25	Steady; quiet ..	..	4/-; Dec., 4/-; Jan., 3/10 to 4/- ..	..	..	4/5½ to 4/6 ..	..
26	Steady; quiet ..	..	4/-; Dec., 4/-; Jan., 4/- ..	..	..	4/6½ to 4/6; 3/11½ ..	..
27	Steady; quiet ..	..	4/-; Dec., 4/-; Jan., 4/- ..	..	..	4/6½ to 4/6; 3/10 ..	..
29	— ..	..	4/-; Dec., 4/-; Jan., 4/- to 4/0½ ..	..	..	4/6½ to 4/6; 3/11 ..	..
30	4/9½ ..	..	4/-; 4/- to 4/0½ (n.s.) ..	..	..	4/6 to 4/6; 3/11 to 4/- ..	4/-
Dec.	Very dull ..	..	4/-; 4/- to 4/0½ (n.s.) ..	..	..	3/11½ (n.s.) ..	..
2	Quiet ..	..	4/-; 3/11½ to 4/0½ (n.s.) ..	..	..	4/5 to 4/5½ ..	..
3	Very dull ..	..	3/11½ to 4/-; 3/11½ to 4/0½ (n.s.) ..	..	..	4/5 to 4/5½; 3/11 ..	..
4	Steady; quiet ..	..	3/11½ to 4/-; 3/11½ to 4/0½ (n.s.) ..	..	..	3/11 to 3/11½ Jan. ..	..
						4/5 to 4/6; 3/10½ to 4/- ..	..

STEAMER FREIGHTS.—Port Adelaide to London, 25s. per ton (8d. per bushel); Port Adelaide to South Africa, 22s. 6d. to 25s. per ton (7½d. to 8d.).

Tramp steamers have been chartered at from 26s. 9d. to 27s. 6d. per ton (8½d. to 8½d.) during the month, full range of Australian ports to United Kingdom-Continent January-February loading. At the close of the month the market was firm at 27s. per ton (8½d. per bushel) for January-February; 28s. 6d. to 29s. per ton (8½d. to 8½d.) for March. Port Adelaide to Melbourne, 10s. per ton (3½d. per bushel). Port Adelaide to Sydney, 13s. per ton (4½d. per bushel).

SAILOR FREIGHTS.—A fair amount of sailing tonnage has been chartered from South Australia to United Kingdom-Continent at from 22s. 6d. to 23s. 6d. per ton (7½d. to 7½d. per bushel), according to the age of the vessel. Business was done with South Africa at 19s. 9d. per ton (6½d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for November, 1909, at the undermentioned stations, also the average total rainfall for the first eleven months in the year, and the total for the eleven months of 1909 and 1908 respectively :—

Station.	For Nov., 1909.	Av'ge. to end Nov.	To end Nov., 1909.	To end Nov., 1908.	Station.	For Nov., 1909.	Av'ge. to end Nov.	To end Nov., 1909.	To end Nov., 1908.
Adelaide	2.67	19.53	26.70	23.75	Hamley Brdg.	1.76	15.49	20.54	16.50
Hawker	0.71	11.03	13.91	13.05	Kapunda....	1.66	18.77	24.17	17.83
Cradock....	0.89	9.83	12.20	12.12	Freeling	2.13	16.96	21.94	17.84
Wilson.....	0.80	10.68	12.68	13.07	Stockwell	1.89	19.41	23.13	19.71
Gordon	0.85	8.22	11.98	13.64	Nuriootpa	2.14	20.20	26.60	21.50
Quorn	0.86	12.90	14.84	15.80	Angaston	2.52	20.68	27.96	21.92
Pt. Augusta ..	1.35	13.84	12.89	12.77	Tanunda	2.31	21.00	28.66	21.52
Pt. Germien ..	1.29	11.48	15.26	18.08	Lyndoch	2.61	21.88	27.49	24.59
Port Pirie ...	0.73	11.97	13.53	16.52	Mallala	1.60	15.83	21.44	17.86
Crystal Brook ..	0.59	14.19	17.83	18.31	Roseworthy	2.05	16.51	22.23	17.18
Pt. Broughton ..	1.06	13.42	16.38	15.32	Gawler.....	2.06	18.32	25.29	17.99
Bute	1.36	14.45	17.61	18.17	Smithfield	1.79	15.64	21.74	19.93
Hammond ..	1.07	10.00	14.29	17.65	Two Wells....	1.60	16.74	19.52	15.63
Bruce	0.80	8.37	10.97	19.23	Virginia	1.84	16.58	22.58	18.13
Wilmington ..	0.96	16.77	20.01	25.21	Salisbury	2.09	17.53	23.68	18.50
Melrose	1.30	21.81	28.32	37.10	Teatree Gully	4.43	25.13	38.76	35.23
Booleroo Cntr.	0.77	14.75	16.93	19.50	Magill	3.33	23.87	36.75	28.62
Wirrabara...	0.69	17.58	23.36	20.51	Mitcham	2.05	24.94	30.14	25.04
Appila	0.93	13.65	16.71	20.34	Crafers	5.43	44.24	66.66	49.49
Laura	1.40	16.62	23.50	26.59	Clarendon	3.72	37.48	43.18	31.22
Caltowie	1.41	15.95	18.48	23.58	Morphett Vale	2.96	22.42	31.32	21.53
Jamestown	1.48	15.91	19.69	20.88	Noarlunga	2.20	19.25	27.45	21.59
Gladstone ..	0.85	14.82	16.45	21.32	Willunga	2.44	24.91	35.60	23.91
Georgetown ..	1.10	17.07	18.12	21.21	Aldinga	2.62	18.98	29.34	19.83
Narridy	0.70	15.89	15.88	18.36	Normanville	1.54	19.76	25.35	19.85
Redhill	1.12	15.47	19.89	22.19	Yankalilla	1.28	20.74	27.48	23.28
Koolunga	1.03	14.77	18.62	20.30	Eudunda	0.95	15.93	16.50	18.85
Carrieton	0.78	10.89	14.22	14.23	Sitherslands	0.41	—	11.28	—
Eurelia	0.65	12.18	13.63	17.50	Truro	1.87	18.40	24.83	21.03
Johnsburg	0.84	8.94	11.87	11.07	Palmer	1.98	—	18.41	14.76
Orroroo	0.64	12.58	13.83	15.34	Mt. Pleasant	2.77	25.91	32.00	27.82
Black Rock	0.70	11.13	14.22	15.03	Blumberg	3.50	28.45	36.03	30.41
Petersburg	0.71	11.90	13.16	16.50	Gumeracha	4.09	31.79	46.05	33.86
Yongala	1.52	12.66	14.96	16.10	Lobethal	3.78	34.37	46.79	34.50
Terowie	0.79	12.41	13.50	15.99	Woodside	3.83	30.13	45.39	33.52
Yarcowie	1.03	12.64	15.75	17.85	Hahndorf	4.23	34.92	44.38	34.54
Hallett	0.83	15.37	14.83	20.84	Nairne	3.14	27.91	37.82	26.83
Mt. Bryan	0.56	14.86	14.96	16.02	Mt. Barker	3.28	29.84	39.54	27.11
Burra	0.52	16.85	18.11	20.51	Echunga	3.70	31.26	46.69	31.26
Snowtown	1.28	14.75	18.92	21.24	Macclesfield	2.66	29.40	36.95	29.64
Brinkworth	0.87	14.90	16.81	19.86	Meadows	3.39	34.10	46.46	33.42
Blyth	1.24	15.15	21.86	21.19	Strathalbyn	1.78	18.18	28.19	20.26
Clare	1.29	23.27	28.59	27.21	Callington	1.39	15.04	19.98	15.45
Mintaro Cntrl.	0.87	21.10	25.18	23.25	Langhorne's B	1.22	14.63	16.91	15.88
Watervale	1.36	26.10	31.63	30.00	Milang	0.87	15.92	17.92	16.87
Auburn	1.44	23.10	33.73	27.33	Wallaroo	1.04	13.12	17.93	17.48
Manoora	0.75	17.26	20.20	18.57	Kadina	1.06	15.11	19.64	16.87
Hoyleton	1.14	17.34	19.90	18.98	Moonta	1.09	14.35	20.27	17.40
Balaklava ..	1.42	15.12	18.43	17.82	Green's Plains	1.67	15.25	20.59	20.44
Pt. Wakefield ..	1.12	12.27	15.26	15.88	Maitland	2.17	19.22	25.87	20.60
Saddleworth ..	0.89	19.01	21.65	18.70	Ardrossan	1.23	13.19	17.28	17.96
Marrabel	1.08	17.12	26.13	19.59	Pt. Victoria	2.09	14.42	18.84	16.13
Riverton	1.26	19.66	24.99	19.64	Currumbulla	1.87	18.03	22.57	15.16
Tarlee	1.48	16.61	21.04	15.69	Minlaton	2.07	16.87	21.05	14.57
Stockport	1.49	15.36	18.45	14.77	Stansbury	1.89	16.30	22.62	16.61

RAINFALL TABLE—*continued.*

Station.	For Nov., 1909.	Avg'e. to end Nov.	To end Nov., 1909.	To end Nov., 1908.	Station.	For Nov., 1909.	Avg'e. to end Nov.	To end Nov., 1909.	To end Nov., 1908.
Warooka	1.61	16.00	18.46	16.15	Bordertown ..	1.36	18.78	22.19	17.29
Yorketown....	1.75	16.96	18.62	15.68	Wolseley	1.10	16.67	22.56	17.13
Edithburgh ..	1.93	15.85	17.77	14.01	Frances	1.21	19.29	24.22	16.38
Fowler's Bay..	0.79	11.86	18.80	12.66	Naracoorte....	1.33	20.99	26.08	20.09
Streaky Bay ..	0.55	14.89	18.00	14.05	Lucindale	1.46	21.67	28.32	22.09
Pt. Ellioton ..	0.76	15.69	18.26	18.06	Penola	1.53	25.32	29.60	24.56
Pt. Lincoln ..	1.93	19.35	19.39	18.61	Millicent	1.39	27.61	38.05	27.49
Cowell	0.42	11.22	9.85	15.70	Mt. Gambier..	1.94	29.91	39.97	27.72
Queenscliff ..	1.19	17.69	18.89	16.69	Wellington ..	1.10	14.27	19.87	15.01
Port Elliot... .	1.31	17.05	19.83	17.86	Murray Bridge	1.19	13.33	19.83	14.24
Goolwa	1.41	16.94	23.74	18.12	Mannum	1.13	11.12	14.17	20.95
Meningie	1.34	18.08	24.33	17.54	Morgan	0.49	8.31	8.32	7.95
Kingston	1.26	23.25	29.74	25.62	O'Land Corner	0.68	10.47	9.60	12.28
Robe	1.30	23.65	29.76	21.67	Renmark	0.63	10.06	10.81	9.42
Beachport	1.34	25.86	37.35	25.42	Lameroo.....	1.06	—	17.71	17.91
Coonalpyn	1.03	16.62	22.53	16.07					

DAIRY AND FARM PRODUCE MARKETS.

The Government Produce Department reports on December 1st, 1909:—

BUTTER.—The demand for butter during the month of November has been particularly good in both prints and bulk, and compares favorably with that of the same month of last year. Considering the unsettled state of the weather, the cream has been coming in good quantities, and it is expected that the December production will be satisfactory. Prices have been well maintained, only superfine qualities easing slightly, and the quality in all grades has been everything that could be desired. The market quotations of the day are—Superfine, 10½d.; pure creamery, 10d.

Eggs. Business continued dull during the month, and the price fell from 8½d. to 7½d. per dozen in sympathy with lower prices ruling in the eastern States. The Perth market did not operate to any extent owing to local supplies coming in freely. The coal strike has materially increased the freight charges, and the slackening of the demand in Sydney caused a sharp drop there of 2½d. per dozen during the latter end of November, and the Adelaide prices receded in sympathy.

Messrs. A. W. Sandford & Co. have supplied the following market quotations for November 30th:—

FLOUR.—City brands, £10 10s.; country, £10 5s. per ton of 2,000lbs.

BRAN.—1s. 1d.

POLLARD.—1s. 2d. per bushel of 20lbs.

OATS.—Local Algerians, 1s. 8½d. to 1s. 9d. per bushel of 40lbs.

BARLEY.—Cape (new), 2s. to 2s. 3d. per bushel of 50lbs.

CHAFF.—£3 to £3 2s. 6d. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—New locals, £10 to £11 per ton of 2,240lbs.

ONIONS.—New locals, £5 to £6 per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 9½d. to 10½d.; choice separators, dairies to second-grade factories, 8½d. to 9½d.; medium dairies, 7½d. to 8d.; well conditioned stores and collectors, 7d. to 7½d.

CHEESE.—Factory makes, 5d. to 5½d., new make; matured, up to 8½d. per lb.

BACON.—Factory cured sides, 9d. to 9½d.; middles, 9½d. to 10d.; well cut and cured farm hitches and rolls, 6d. to 7d.

HAMS.—Factory, 11d. to 11½d.; country, 7d. to 9d. per lb.

Eggs.—Loose, 7½d. per dozen.

LARD.—Skins, 6½d.; tins or bulk cases, 6d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb.; dark and ill-flavored, 1d. to 1½d.; beeswax, 1s. 1d. per lb.

ALMONDS.—Soft shells, Brandis, 7d.; mixed soft shells, 6d.; kernels, 1s. 3d. per lb.

LIVE POULTRY.—Prime table roosters, 3s. to 3s. 6d. each; cockerels, 2s. 3d. to 2s. 9d.; hens, 1s. 2d. to 1s. 8d.; ducks, 1s. 1d. to 2s. 6d.; geese, 4s. 3d. to 4s. 9d.; pigeons, 6½d.; turkeys, worth 10d. to 11d. per lb. live weight, for fair to good table birds.

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Dec.	Jan.			Dec.	Jan.
Amyton	444	—	—	Meningie	*	25	22
Angaston	449	25	22	Merghiny	*	—	—
Appila-Yarrowie	*	—	—	Millicent	—	14	11
Arden Vale & Wyacca	*	—	—	Miltahle	*	4	1
Arthurton	†	—	—	Minlaton	452	—	—
Balaklava	*	—	—	Moonta	†	—	—
Beetaloo Valley	*	—	—	Morchart	*	—	—
Belalie North	446	—	—	Morgan	*	—	—
Bowhill	*	—	—	Morphett Vale	*	—	—
Brinkworth	447	—	—	Mount Bryan	*	—	—
Bute	451	—	—	Mount Bryan East	*	4	1
Butler	—	—	—	Mount Gambier	466	11	—
Caltowie	*	20	24	Mount Pleasant	462	—	—
Carrieton	*	23	20	Mount Remarkable	445	—	—
Cherry Gardens	458	21	25	Mundoora	*	—	—
Clare	*	24	21	Nantawarra	450	22	19
Clarendon	459	27	24	Naracoorte	466	11	8
Colton	453	25	22	Narryd	*	—	—
Goomooroop	444	22	—	Northfield	—	—	—
Coonalpyn	456	—	—	Orroroo	*	—	—
Cradock	†	—	—	Parrakie	—	—	1
Crystal Brook	*	—	—	Paskeville	*	25	22
Cummins	453	25	22	Penola	—	11	8
Davenport	444	—	—	Penong	454	—	—
Dawson	445	—	22	Petina	455	—	—
Dingabledinga	*	10	14	Pine Forest	453	—	—
Dowlingville	*	—	—	Port Broughton	447	24	21
Forest Range	459	23	20	Port Elliot	463	—	15
Forster	—	25	—	Port Germein	447	—	—
Fowler Bay	†	25	22	Port Pirie	447	—	15
Frances	*	—	—	Quorn	†	—	—
Freeling	449	—	—	Redhill	*	18	15
Gawler River	†	—	—	Renmark	458	—	—
Georgetown	*	25	22	Rhine Villa	*	—	—
Geranium	457	25	29	Riverton	*	25	22
Golden Grove	†	23	20	Saddleworth	†	17	21
Goode	—	—	—	Salisbury	*	—	—
Green Patch	—	20	24	Shannon	455	—	—
Gumeracha	*	20	24	Sherlock	458	—	—
Hartley	460	18	22	Smoky Bay	*	—	—
Hawker	*	24	21	Stansbury	*	—	—
Hookina	*	—	—	Stockport	—	27	—
Inkerman	*	23	20	Strathalbyn	*	20	17
Johnsbury	445	—	—	Sutherlands	*	—	—
Kadina	†	—	20	Tatiara	467	—	—
Kalangadoo	465	11	8	Uraildlaand Summert'n	464	—	—
Kanmantoo	461	24	21	Utera Plains	456	25	22
Keith	465	—	—	Virginia	*	—	—
Kingscote	461	6	3	Waikerie	—	—	—
Kingston	*	25	29	Watervale	*	—	—
Koolunga	*	21	25	Wepowie	445	—	—
Koppio	454	23	—	Whyte-Yarcowie	448	—	—
Kybybolite	465	23	20	Wild Horse Plains	451	—	—
Lameroo	457	—	—	Willunga	*	4	1
Lipson	*	—	—	Wilkawatt	*	—	—
Longwood	462	18	21	Wilmington	446	23	22
Lucindale	†	—	29	Wirrabara	446	4	—
Lyndoch	†	—	—	Woodside	*	—	—
Maitland	451	—	—	Yallunda	*	—	—
Mallala	*	6	3	Yongala Vale	448	—	—
Mannum	457	—	—	Yorketown	*	11	8
Meadows	—	27	—				

* No report received during the month of November.

† Only formal business transacted at the last meeting.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Amyton, October 27.

(Average annual rainfall, 1 $\frac{1}{2}$ in.).

PRESENT—Messrs. Brown (chair), T. and Walter Gum, Ward, Baumgartel, Crisp, Thomas (Hon. Sec.), and two visitors.

WHEAT PROBLEMS.—In reply to a question as to the best method of pickling seed, some members preferred doing the work on floor and others in a pickling tub, or cask, with the seed in a bag. A member asked, “At what stage in the life of the wheat plant does the rain cease to be beneficial?” Members were agreed that the plant needed moisture till the grain was about ripe, but several considered that if rain fell after the plant was turning yellow it would cause the grain to shrivel. They considered that the plant usually drew sufficient moisture with the deeper roots when the top soil was dry.

Coomooroo, November 1.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Berriman (chair), Avery, Toholke, Ward, E. and E. C. Brice (Acting Secretary).

BLACKSMITHING ON THE FARM.—Mr. Ward read a paper on this subject as follows:—“Every farmer should have a forge and anvil and a few necessary tools. He would often save a journey to the blacksmith and the loss of time involved. When farmers have a small breakage on some implement and do not want their teams to be idle, they will try to patch it up for a time by using wire, and very often will cause another breakage or strain some other part of the implement. Having a forge a farmer can effect necessary repairs in his spare time. The cost of bellows, anvil, stock and dies that a farmer would require would not be very great. The cost of a shop would also be small. On wet days, when unable to work on the farm, time can be well spent in making up S hooks, eyebolts, &c. The cost of coal and iron required would be small.” Mr. Berriman thought that a portable forge was best, as this did not need a shop and could be easily moved; but this met with general disapproval. Members preferred the shop, it being safer in the summer and convenient in wet weather. Mr. Avery said that a piece of old rasp welded on the point of a plate share stood as well if not better, than a new share. Mild steel was preferred to spring steel for plating shares. Mr. Ward considered that when tempering cold chisels they should be blood-red when taken from the fire and should be held in the water till the second shade had gone and then gradually cooled off. Mr Brice found driving the chisel in the ground when at blood-red heat gave as good a temper as any other way, and this was less likely to snap the point off. It was estimated that £7 10s. would buy a very fair outfit for a blacksmith's shop on the farm.

HAYMAKING.—Considerable discussion took place on this subject. Members thought Dart's Imperial the best wheat for hay in this district. They recommended cutting oats on the green side, while wheat, if cut green, will sometimes scour horses. They consider it unwise to make large round stooks. It was thought stooking should be done as soon as possible after cutting, and it was mentioned that flat sheaves were better to stack than round ones.

Davenport, November 11.

(Average annual rainfall, 9in.)

PRESENT—Messrs. Bothwell (chair), Roberts, Holdsworth, Bice, Gosden, Lecky (Hon. Sec.), and one visitor.

ANNUAL MEETING—The report given showed that the average attendance had been seven members, the number on the roll being 12. Ten papers on interesting and important subjects had been read and discussed. The chairman made an appeal for a better attendance in the new year's work, and members present each undertook to try to obtain a new member for the Branch by next meeting.

Dawson, October 30.(Average annual rainfall, 10 $\frac{1}{2}$ in.)

PRESENT—Messrs. Renton (chair), Jos., F., and John Wilson, Kennedy, Quinn, Smith, Warner, Baker, C. H. and H. L. Meyers, and J. Nottle (Hon. Sec.).

HAYMAKING.—Mr. Kennedy introduced this subject. He found that hay cut with the mower was the best to feed horses while at work; as with the hay cut with the binder the horse would only bite the heads off. Although there had not been many binders in the district, some members had had the opportunity of using one, and they found the hay cut with it much better to handle than that which was cut with the ordinary mower. Most of the members considered the best hay wheats for this district were Purple Straw and Yandilla King. It was also thought that any farmer who had stock would be wise to cut a good quantity of hay; if it were not used this season it would be very valuable in case of drought.

Johnsbury, October 30.(Average annual rainfall, 9 $\frac{1}{2}$ in.)

PRESENT—Messrs. Read (chair), Brook, Hollett, Chalmers (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—This meeting was held at the homestead of the Hon. Secretary, and the opportunity was taken to inspect the Government experimental plots. Unfortunately two bad days, with hot winds, caught the crop just as it was coming out in ear. This and the dry spring had caused a good deal of it to blight. Since September 1st there had only been 91 points of rain, 49 points in September, and the balance (51 points) in October. The plots that were worked most looked worst, but on a plot of fallow, where a manure test was carried out, the manured portion was much superior to the unmanured part.

Mount Remarkable, November 27.

(Average annual rainfall, 21in.)

PRESENT—Messrs. Casley (chair), Oldland, George, Bauer, McIntosh, Morrell, and Lambert (Hon. Sec.).

NEW SAMPLE OF WHEAT.—Mr. T. H. Casley showed a nice sample of Huguenot wheat, a few heads of which he had obtained from Mr. J. Arthur's farm in this district. He stated that the crop would average 5ft. 6in. to 6ft. in height. A lengthy discussion took place regarding its grain and haymaking qualities. The grain shown was nice and plump, although not quite ripe. Mr. Arthur has about five acres of this variety.

THE SHARE SYSTEM.—In the November issue we reported Mr. Casley, of Mount Remarkable Branch, as having expressed himself in favor of working farms on the share system. We have received a letter from Mr. Casley saying that this is a mistake, and he desires it to be known that he is not in favor of this method of working the land.

Wepowie, November 2.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Crocker (chair), T. and A. J. Gale, Fuller, Pearce, Coad, Roberts, Knauerhase, Rielly, J. and T. F. Orrock (Hon. Sec.), and one visitor.

VETERINARY SURGEONS.—Mr. Rielly read a paper on this subject. He favored the suggestion which had previously been made to mark off districts and appoint a veterinary surgeon for each district. He would like to see it arranged for the service of veterinary surgeons to be free to farmers and others, because in the case of infectious diseases the question became of national importance. The duties of inspectors of stock could be combined with those of veterinary surgeons for each district. Such an arrangement would admit of the speedy destruction of any animal suffering from a contagious disease. The officer should make periodical visits to each farm and stallion. Under existing arrangements he considered it possible that many beasts found their way to the butchers or were killed on the farms that were unfit for human consumption. He thought owners should be compensated for any beasts destroyed in the public interest. A good discussion followed. Mr. Gale thought the expenses of veterinary surgeons should be borne by the Government. Mr. Orrock considered that farmers and stockowners should co-operate and guarantee a certain salary, each member to pay for the services of the veterinary surgeon.

Wilmington, October 28.

(Average annual rainfall, 17½ in.)

PRESENT.—Messrs. Slee (chair), Heard, Noll, Hannigan, J. and G. Schuppan, Crawford, Scholefield, Payne, S. and D. George, W. Stephens, B. Jericho (Hon. Sec.), and one visitor.

MAGPIES.—It was considered that it would be a great mistake to give effect to the suggestion of the Port Elliot Branch to take magpies off the protected birds list. These birds have proved themselves to be exceedingly useful for the destruction of grasshoppers.

Wirrabara, November 6.

(Average annual rainfall, 30 in.)

PRESENT.—Messrs. P. Lawson (chair), Curnow, Blesing, H. E., A., and G. Woodlands, W. and W. H. Stevens, Pitman, Hoskins, Lawson (Hon. Sec.), and one visitor.

FENCING.—The following paper was read by Mr. Pitman:—"The erection of good fences is the aim of most farmers. To secure good posts select the oldest timber procurable, and as soon as each tree is felled remove all the bark from the portion to be used, as this allows the sap to dry out of the timber more quickly, and adds to the durability of the posts more than most people think. If any bark is on the posts when they are put in the ground, it soon rots and leaves a space around them. Remove any rubbish from where the earth will be thrown, as the soil cannot be firmly rammed round the posts if rubbish is filled in with it. Place the posts in the holes upside down, as they will last so much longer than if they are erected with the same end to the top as was the case in the tree, providing of course that they are anything like equal in size at both ends. When filling in the holes do not put in too much earth before using the rammer. If the soil taken from the holes should be wet add a few stones, as this will greatly assist in getting the soil firmly around the posts. If possible, have solid logs for strainers. Hollow ones are too easily split when driving in the plug to hold the wire. When boring the strainer keep the first hole at least 4 in. below the top of the post to prevent splitting. For stays have good solid sticks about 9 ft. long with all the bark removed, mortise a place in the strainer for the top end and place a stone at the bottom in preference to a piece of wood. Before straining the wires cut away a little of the sharp edge round the hole in the strainer on the side on which it is intended to turn the wire, to prevent the wire from breaking where it is bent. Strain the bottom wire first and work upwards. Turning all the wires round one side of the strainer may split it; therefore turn half round each side. Galvanized wire is much better to handle than black, and will last longer. The difference in price is about 2s. per hundredweight. It is not wise to strain wires on wet or very cold days, as they will not then stretch well, but will slacken when the warm weather comes. Some farmers will not use round posts, but many of the split ones erected are of poorer quality than round timber which is rejected." A good discussion followed.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Belalie North, October 27.

(Average annual rainfall, 16½ in.)

PRESENT.—Messrs. Warner (chair), Heithersay, Hall, Arndt, Atkin, Cummins, Tremlett, Smelt, Steer, O'Leary, Daly, Heithersay, Waldhutter, Bladon (Hon. Sec.), and nine visitors.

EXAMINATION OF STALLIONS.—Mr. W. T. Hall initiated a discussion on the question of examination of stud horses. He considered the present action would lower the price of stud horses, and that farmers would not purchase them for fear that they might be condemned three months later on account of some little defect in the legs. While he favored the restrictions placed on animals with some hereditary disease, he did not think it should extend to a few blemishes in the legs. The conditions of appeal seemed to Mr. Hall to be one-sided. [Farmers will recognise that this arrangement is for their benefit as well as for the benefit of the general public. Probably if farmers and others are wise they will insist, before buying a stallion, upon the production of a certificate of soundness, and thus the contingency referred to by Mr. Hall will not arise. According to the regulations (printed in the October *Journal*) horses will not be rejected on account of "some little defect in the legs."—Ed.]

Brinkworth, October 26.

(Average annual rainfall, 14½in.)

PRESENT—Messrs. Brinkworth (Chair), Hawker, Nettle, Stott, Green, Rowe, Wood Wundke, Horrocks, Hill (Hon. Sec.), and three visitors.

TAKEALL.—Mr. Horrocks tabled some wheat plants which were affected with takeall. The disease was described and shown to the members. The effect of the fungus from the roots to the first joint was very apparent.

Port Broughton, October 22.

(Average annual rainfall, 14in.)

PRESENT—Messrs. Barclay (chair), Dalby, Hicks, Evans, Dolling, Whittaker, and Pattin-gale (Hon. Sec.).

TAKEALL.—It was reported that takeall was very prevalent in this district. Nearly all farmers had part of their crops affected. It was said to be a worse pest than red rust used to be.

Port Germein, September 30.

(Average annual rainfall, 12in.)

PRESENT—Messrs. Carmichael (chair), Deer, Head, Holman, Simper, Turner, Blesing (Hon. Sec.), W. L. Summers, and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of the chairman. A thorough inspection was made of the wheats entered for the Government wheat prizes, and also the adjoining wheats. Flag smut (often miscalled black rust) was very noticeable in the Gluyas Early wheat and Federation. One of the competition wheats and Carmichael's Eclipse were almost free from it. It was remarked that although pickling with bluestone prevented ball smut (*bunt*) it did not seem to be effective in regard to flag smut. On returning to the homestead Mr. W. L. Summers gave an address on the objects of wheat competitions. He advised farmers to go in for "selection" work, more than in the past, in their best and proved varieties. It has been demonstrated in more than one place that time spent in this way was amply repaid by results. Mr. Carmichael was suitably thanked for the hospitality extended.

Port Pirie, October 23.

(Average annual rainfall, 12½in.)

PRESENT—Messrs. Hawkins (chair), Johns, Munday, Jose, Greig, Stanley, Birks, Kavenagh, and Wright (Hon. Sec.).

SHEEP ON THE FARM.—The following paper was read by Mr. Jose:—"Does it pay to keep sheep on the farm? It depends a great deal on the circumstances, among which must be considered the quality of the land, number of paddocks available, style of fencing, and the water supply. In this district, however, we are fortunately situated in regard to the last-named item. The keeping of sheep in conjunction with wheat-growing has not been practised to any great extent in this district, perhaps owing to the sandy nature of a large portion of the land. With careful management a few sheep on a farm, besides saving a considerable amount of work in cleaning the land of weeds at fallowing time, will bring in a good return to the owner. There are various breeds of sheep each of which have their advocates, but for this district I prefer the Merino, which should be of big frame and good wool. The Merino is the hardiest of sheep, and is not so liable as other types to break fences. In most cases it will be wise for the farmer to purchase station-bred ewes to breed from, as you can breed a lamb straight away which will bring in a quick return, and at the age of six months will be about the value of the ewe. For breeding lambs for export I prefer the Shropshire or Dorset Horn rams crossed with the Merino ewes. I do not think it pays to breed ewes to breed from, because you lose the time before they are old enough to breed from, where an older ewe would rear a lamb; and you generally lose a few maiden ewes, which a small flockowner can ill afford. Grazing sheep on fallow land in the more sandy portions of this district tends to cause sand-drift, but they do much good by treading down the fallow, making it firm, whereby a good seed bed is obtained. Sheep should be changed frequently from one paddock to the other. Where kept in small paddocks it is not advisable for them to be pastured with other stock, or else the latter will suffer. I find that sheep should be allowed full advantages of the green feed when it is young; especially does this apply to wild oats, as sheep do not take readily to them after they have gone to seed. When oats are at this stage it would be better for horses or cattle to be turned on to the land, as they do well on them. Killing the crossbreds and poorly-wooled sheep for mutton is one

way to keep a good flock, and provide the house with fresh meat, which is a big item in a large family. Ewes should not be kept too long. When they get old they get harder to fatten or sell, and they naturally rear a poorer lamb and grow poorer wool. I do not think sheep are as profitable as cows, according to the feed they consume, but the labor connected with cows is such a tie morning and night, and they are much harder on fences, &c. Put sheep into a sheep-proof paddock and they are no more trouble for a while if dogs do not worry them. Rabbits do not like to stop with sheep if feed is short. A yearly income for a ewe ought to average 12s., lamb and wool. A 640-acre farm ought to keep 200 sheep all the year round, with lambs in the winter and spring. The cost of shearing is very little." Mr. Munday agreed that the big frame Merino was the most profitable sheep to keep on small holdings. It was hardly worth while for farmers to breed lambs for export, as there was a considerable amount of expense, and at present market rates he did not think much profit could be made. The Shropshire or Dorset Horn rams crossed with Merino ewes produced an ideal lamb for the export trade. The Romney Marsh was a good sheep, but it was not suited to local conditions. It was not wise to keep old sheep. An eight-tooth sheep should be disposed of, although a ewe was capable of rearing two lambs after that age. The Chairman said that sheep on the farm were very useful, but in good seasons more profit could be made by wheat-growing. Sheep had to practically be half-starved on fallow, and consequently it was impossible to obtain good results. He had noticed that where sheep had been yarded on the sandhills the crop was much better than it was even on the flats. Mr. Greig agreed with Mr. Jose that it was not advisable on small farms to breed lambs for export, as they could not be fed properly on fallow. They must have plenty of feed so that they may be kept growing. The pure Merino was the most suitable sheep for this district. He advised purchasing the best sheep obtainable to breed from. Mr. Johns considered that on a farm of 640 acres it was not advisable to keep sheep, as the feed was soon eaten off, and the rest of the farm stock had to exist in a half starved condition. Mr. Stanley agreed that sheep on the farm pay even if kept only to supply the household with mutton; 12s. per annum was about the right return from a sheep. Mr. Birks said that sheep do much good by treading and manuring the fallow, and the succeeding crops are benefited as a result.

NEW SEASON'S WHEATS.—Mr. W. Munday tabled a sample of Huguenot wheat which measured 6ft. in height. The Secretary tabled a sample of new season's wheat of the Gluyas variety which weighed 63 $\frac{1}{2}$ lbs. per bushel.

Whyte-Yarcowie, October 30.

(Average annual rainfall, 13 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Pearce (chair), T. and H. M. Pascoe, J. E. and W. Hunt, Walsh, E. M. and G. F. Jenkins, Mudge, McLeod, W. G. and F. H. Lock (Hon. Sec.).

FIELD TRIAL.—A successful field trial of cultivating implements was held on October 22nd under the auspices of this branch. The trial was non-competitive and gave general satisfaction. The implements exhibited, viz., seven ploughs, one skim plough, and five cultivators all did good work, and the opinion of those present was very divided as to which were the best implements.

AUTUMN AND WINTER FODDER.—Mr. E. M. Jenkins read a paper on this subject from page 223 of October *Journal*. In the discussion which followed members agreed that the subject was one of great importance to all farmers, and that more must be done in providing fodder for winter months, both by conservation and the growing of early green feed. One member thought that wild mustard would make good ensilage. He preferred Cape barley for early green feed. Mr. Pascoe thought the cultivation of foreign grasses should receive greater attention.

Yongala Vale, November 20.

(Average annual rainfall, 13 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Battersby (chair), Lloyde, F. and H. Miller, G. and D. Dowd, Chig-widden, W. and J. Simon, Marshall, Edson, C. and E. Fowler, Cooper, Scott, Eliot, Fogerty (Hon. Sec.), and four visitors.

FIRST AID TO THE INJURED.—Mr. Bladen, in introducing this subject, mentioned that it was of the greatest importance to know the manner of assistance to be rendered to the injured so as to avoid making their sufferings worse instead of relieving pain, and in many cases causing the injury to become greater by unwise treatment. So many accidents occurred daily around us that it would be a wise thing for all to understand how to render practical first aid. In the case of hemorrhage, he explained fully how to determine capillary, arterial, and venous bleedings, and how to stop the hemorrhage with ligatures and

with the hand. In the case of fractures, he explained how to detect a broken arm, collarbone, jaw, thigh, leg, and dislocated joints, and how to render practical first aid in such cases. In the case of apparently drowned persons, he explained how to clear the water out of the stomach, to clean the mouth of mud and silt, and how to bring on respiration and circulation of the blood. In the case of snakebite, when assistance was not at hand, he recommended to tie a ligature between the wound and the heart, slit the wound with a knife, fill it with gunpowder and light it; or, if sulphuric or nitrid acid was available, to fill the wound with the same. This would check and destroy the venom. A vote of thanks was accorded Mr. Bladen for his paper. In the long discussion that took place snakebite received considerable attention, especially in the cases of horses and cattle. Members were told that snakebite caused lockjaw in horses, and that injury to the frog of a horse's foot would cause blood poisoning. [The value of permanganate of potash (Condy's crystals) in a case of snakebite has been emphasised a good deal lately. The wound is scratched or cut with a knife and a few crystals applied at once. This, of course, after the ligature has been applied.—Ed.].

STALLIONS.—After a long discussion on stallions members were of opinion that the regulations dealing with same were not satisfactory.

LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT.)

Angaston, October 30.

(Average annual rainfall, 21 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Stevens (chair), Wishart, Friend, Waters, Player, Sibley, Swann, Ball, Smith, Salter, Matthews (Hon. Sec.), and two visitors.

VISIT TO ROSEWORTHY COLLEGE.—Mr. Waters gave an account of his visit to the Roseworthy Agricultural College. The crops were looking splendid. The outside buildings were well kept and up to date in every way. The dormitories and lavatories he considered a great improvement, and a boon to the students. The college itself was, in his opinion, an object lesson to the producer; and everyone should not only visit the college, but keep in touch with the work going on there. The usefulness of the college, and the up-to-date appointments were a credit to the Government and the State.

SPRAYING FRUIT TREES.—From a discussion which took place on this subject it appears that members had proved to their own satisfaction that with ordinary care spraying did not burn sufficiently to be termed "injurious." It had also been found that it was quite safe to use Bordeaux mixture after arsenate of lead, or *vice versa*, as no injury would result. For curl leaf it had been found the best results were obtained from autumn and winter spraying, and again when the buds were about to burst; but the more important time was when the tree was at rest. For rose and peach aphis members had found soft soap with tobacco leaf the best remedy, using a much stronger solution for the peach than the rose.

Freeling, November 12.

(Average annual rainfall, 17 $\frac{3}{4}$ in.)

PRESENT.—Messrs. A. Mattiske (chair), Steinfeldt, H. Mattiske, Shanahan, Koch, Elix, Kleinig, Neldner, Block (Hon. Sec.), and two visitors.

HORSE-BREEDING.—The Chairman read a paper on this subject to the following effect:—"With the exception of a few stud farms, where only a few horses are bred, owners in South Australia do not exercise enough care in horse-breeding. Even when the sire is a good animal the most suitable mares are not chosen for him. On large stations where there are more than 10 stallions running out on one run, there is no such thing as picking the mares that are suitable for any particular horse. No one knows what is the sire of this or that foal, and where there are so many horses at large there must necessarily be some inbred, besides the perpetuation of other defects in breeding that depreciate their value. An inbred horse is not the most desirable

animal to have, although it may do its share of the work. Such an animal can hardly ever be called quiet, as he may start to buck and kick, no matter how carefully broken and handled. A colt may carry his rider nicely for several miles, and seem to forget he is there, and then suddenly look up and see him, take fright, and start bucking. Such a horse is deficient in memory and brain power, and this is a result of inbreeding. A clean-bred animal will hardly ever buck or kick more than once, and not then if properly handled. The better bred he is the quieter he will become, and the more brain power he will have. The inbred animal is very deficient in memory. Teach him to stand while you get on, crawl about his legs, jump over him, flick him with a bag or cloth; then go away from him for a few minutes, and when you again try to approach him he won't let you; he will actually forget in two minutes that he ever saw a man in his life. If we give a well-bred animal ten minutes' schooling he will never forget it. He is easily made to understand, and will remember the slightest detail. For breeding draught or blood horses have pure stock, and to breed half-breds always have a thorough-bred sire. The following hints for horse owners may be of value:—Never burn lampas in a horse's mouth, as the practice is cruel and barbarous; if the animal is fed as he should be he will never have lampas. The trouble is caused by want of food, and stable-fed horses are not subject to it. Never fancy you can improve on Nature's handiwork by docking a foal's tail; Nature does not provide any unnecessary appendages, and the practice of docking is cruel in the extreme. Besides having a weakening effect on the animal's back, all the sinews are cut off at the ends, and the spinal cord, which has direct communication with the brain, may be affected. To produce the class of horses required, great care and judgment must be exercised in selecting the whole of the stud; and a good deal will depend upon the class of country chosen to rear them on. I much prefer limestone country, and the far north of South Australia is the most suitable part in which I am certain the industry could be carried on with profitable results." In discussing the paper, Mr. Kleinig thought that burning lampas was of benefit to the horse, although, like all other operations, it was painful. [According to an American work on horses published in 1908, the practice of burning lampas is not only very cruel, but never of any value. It is only on the rarest occasions that any treatment is necessary. When any operation is needed, a few shallow punctures in the mucous membrane made by an expert with a sharp knife, which has been sterilised, will afford relief. The trouble in South Australia has been that any slight swelling of the roof of the mouth has been called "lampas," and many animals have been subjected to this cruel practice of burning when they really were not suffering from the complaint at all.—Ed.] Members were agreed that the best way to treat a horse after eating clean wheat was to let him have a drink of water and give him exercise. A case was mentioned in which a number of horses obtained some wheat and the owner kept them away from water; one, however, broke away and drank water before it was recaptured. That animal was less affected than the others.

Nantawarra, October 27.

(Average annual rainfall, 15in.)

PRESENT—Messrs. Smith (chair), Herbert, Dixon, Sutton, Greenshields, Nicholls, Sleep, Sinclair, and Gosden (Hon. Sec.).

STOCKING HAY.—After discussing Mr. Davis's paper on "Haymaking" which was read at the Adelaide Congress, members declared themselves in favor of round stocks on account of the better color and weight of the hay resulting.

CULTIVATING FALLOW.—Mr. R. Nicholls reported that a local farmer had 150 acres of fallow last season. He cultivated half during the spring, and left the remaining portion in a rough state. The whole paddock had the same treatment at seedling time. From the present appearance of the crop, there would be a difference of at least 5bush to 6bush. per acre in the yield. A few acres in the same paddock was further treated with a skim plough to destroy melons, and the crop on this part is still better.

ROSES.—Members congratulated Mr. A. Herbert on the production of a varied collection of beautiful roses grown in his garden and exhibited at the meeting.

PRICES OF WHEAT.—Mr. R. Nicholls drew attention to the increased margin of difference between Port Adelaide and Port Wakefield prices of wheat. He wished to know if members had inquired why this increase was made. The same speaker was anxious to know why the cabled London quotations showed a difference of 4½d. per bushel between old wheat and new, and the Port Adelaide quotations a difference of 8d. per bushel between old and new wheat as shown in the quotations published in the *Advertiser* of October 27th. [We are informed that no alteration has been made in the usual margin of 2d. between Port Adelaide and Port Wakefield prices. If the price in Adelaide is regulated by London quotations, the difference between old and new seasons' prices should be the same in both places. Reference to this matter was made in the wheat market report last month.—Ed.]

Wild Horse Plains, November 13.

Present—H. A. Lyons (chair), Clark, Rundle, Hartley, Wilkins, Wood, Bailey, J. and H. Lyons (Hon. Sec.), and three visitors.

TAKEALL.—A general discussion took place on the question of takeall. Some members attributed the prevalence of the disease to working the land in dry weather; others expected the best returns from land that was ploughed up after harvest in a dry condition. Grubs had been seen in great numbers in the affected crops, but not in other crops. Members were of opinion that sowing oats was the only way to combat takeall. Where oats had been sown on stubble land fine crops were assured, but where wheat was sown on similar land and under the same conditions the crops would be a comparative failure.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Bute, October 26.

(Average annual rainfall, 15in.)

PRESENT—Messrs. A. Cousins (chair), Barnes, Scholefield, Sharman, Masters, Rauth, Axford, Stevens, Buchanan, Trengrove, Bettess, Hall, Heinrich, E. Cousins, Schroeter, McEvoy, M., D., and L. McCormack (Hon. Sec.).

VETERINARY SURGEONS.—A discussion took place on the resolution carried by the Congress in regard to this matter. It was considered by some that the necessary salary and expenses should be paid by the Government as a greater safeguard against the spread of diseases. It was pointed out that existing arrangements successfully guarded against this, and the opinion was freely expressed that stockowners should be prepared to pay for the services they received from the veterinary surgeons.

Maitland, November 6.

(Average annual rainfall, 19½in.)

PRESENT.—Messrs. Opie (chair), Bawden, sen., Heilemann, Hill, Jarrett, jun., Lamshed, Lutz, and Pitcher (Hon. Sec.).

WHEAT-GROWING.—A general discussion on wheat-growing was initiated by Mr. Hill, who also tabled samples of various wheats. Gluyas's Early he considered a rust-proof wheat, but it went down badly. It should be sown late in the season. Gluyas that had been fed down by stock was a very poor plant. Medeah was also a very poor plant, sown in the early part of May. Of Dart's Imperial two samples from the same paddock showed a very decided difference. Yandilla King was a good plant, but this was grown on fallow land. Other samples were in various stages of takeall, i.e., drying off. Mr. Hill thought the incessant cold and frosty weather was the cause of the failure, or that pickling with bluestone had something to do with it. Mr. Jarrett, jun., considered that if all the wheats had been grown on fallow land they would all have had the same chance. He does not believe in cropping wheat successively, and instanced a case in which he cropped land 10 years ago with Cape oats and can see a difference when cropped with wheat now. Mr. Opie thought it was possible to grow wheat crops successively by working the land well and applying nitrogen. He suggested watering a small patch of the affected crop with a solution of nitrate of soda as an experiment. The general opinion of members was that overcropping was the cause of the wheat plant failing. Mr. Hill considered Yandilla King the best wheat to grow in this district. Members considered that as far as takeall was concerned it was immaterial what kind of wheat was grown, while Mr. Opie thought that neither weather nor soil had anything to do with it. If the plant was weak when attacked by the fungus it succumbed to the attack.

BOTFLY.—Mr. Opie gave an instructive address on the life and habits of the botfly. He also exhibited a full-grown fly by means of a powerful magnifying glass. He warned all farmers to look after their stock at this period of the year.

Minlaton, November 6.

(Average annual rainfall, 17in.)

PRESIDENT—Messrs. Boundy (chair), Anderson, Correll, Lang, Page, Parsons, Martin, R. H. and J. McKenzie (Hon. Sec.).

BOTFLY.—It was stated by members that the botfly was very prevalent in the district just now. The need for care of horses was emphasised and in the event of eggs being deposited on the horse members recommended rubbing the part with a solution of carbolic. Some had used Stockholm tar to keep the fly away.

FARMING IN ENGLAND: A COMPARISON.—Mr. Page read the following paper on this subject:—"The lot of the English farmer, compared with those of Australia, is not a happy one. Rents are very high, ranging from £2 to £8 per acre for agricultural land, and the tenure is very insecure; the land in almost every case being held on a term of one year only. There are practically no Crown lands in England, as we understand them, the whole of the farming lands being held by rich private owners, and being let to the tenant farmers at a yearly rental. I did not meet one farmer who owned the farm which he occupied. The English farmers are very reserved and conservative as a class, and are unwilling to discuss agricultural matters with farmers from other parts of the world. They seem to me to look on them as their natural enemies, and to think that but for the other producers of the world competing against them in the production of wheat and other grain they would realise a much better price for their products. Nevertheless the Englishman has the better of the Australian in wheat, as he can obtain from 1s. to 1s. 6d. per bushel above the price realised in this country. Another advantage which the English farmer has is that labor is plentiful and cheap; but the cost of production in other ways must more than counterbalance the cheapness of labor. Where the Australian farmer would do with one or two men the English farmer would employ four or five. Agricultural methods appear to be much more advanced and scientific in Australia than in England; and the same might be said of labor-saving machinery. The multi-furrowed plough and the large six to ten horse teams are unknown in England; in fact, where more than two horses are used they always have an extra driver. I saw a small seed drill being worked by three men and one boy and three horses—one man driving two horses attached to the pole of the drill, a boy leading one horse in front, and two men walking behind the drill. I also saw the same way of working a twine binder—two horses behind driven by a man, and one horse in the lead being led by a boy with one man on the seat of the machine. The English farmer does not sow a crop for hay, but cuts what is called meadow grass and clover. It is left on the ground for days, or even a week, after it is cut; then it is raked up into rows and tossed about until dry; it is then carted into the stack. In some places instead of carting the hay with wagons or drays, they have a long rake, or scraper, 15ft. or 20ft. long, with a horse attached to each end. With this the hay is dragged up to the stack. It is then thrown on to a spiked elevator and elevated to the top of the stack, where it is taken and stacked by men with their hands—not pitch forks. The wheat crops in the parts visited looked no heavier than the best in this district. I was told, however, they should yield from 30bush. to 50bush. per acre. The oat crops were very heavy, and should yield anything from 50bush. upwards. The barley crops which I saw were very moderate, and not nearly so heavy as the best in this district. The samples tabled were taken from a crop in Sussex. It will be noticed that the wheat heads carry from three to five grains in a set. The fact that all grain crops in England are bound and threshed with a header, or threshing machine, and that consequently little or no loss of grain occurs during harvest operations would, no doubt, improve the yield per acre. Stock of all kinds, including poultry, are very much dearer than in Australia. Dressed fowls are worth from 3s. 6d. to 6s. 6d., and turkeys anything up to 30s. Fat sheep realise from £2 to £3 in the market, and fat bullocks up to £20; while draught horses are worth anything up to £70 or £80. The farm stock, however, is much superior to ours, particularly horses. I was very much surprised, both in England and Ireland, to see the splendid class of horses working in the towns and on the farms. Whether hackney carriage horse or ponies, they were all in good condition, good movers with plenty of style, and in most cases perfectly sound; while the farm horses and those working in drays or wagons about the towns were as good or better than the stallions travelling for hire in this district. I was much impressed with the class of draught horses used in France. The Norman Percheron, or French Greys, have fairly large, well-made bodies, with rather light bone, and very little hair about the heels. They appear to be good workers and very active, and almost all dark or dappled grey in color. A very noticeable peculiarity in both Italy and France is the absence of geldings and mares from the working teams; nearly all are stallions. I have seen as many as five stallions at work in one team in France. Apparently they do not use the operating knife in those countries,

Pine Forest, October 26.

(Average annual rainfall, 13in.)

PRESENT.—MESSRS. JOHNS (chair), NELSON, PEARCE, SCHULTZ, AND BARR, JUN. (HON. SEC.).

(GOVERNMENT EXPERIMENTAL PLOTS.—Members were delighted with the appearance of the experimental plots being grown locally. They were estimated to yield up to 20bush. per acre, as against last year's actual return of 6½bush.)

Members agreed, on the motion of Mr. Schultz, to each carry out a series of experiments in such matters as depth of ploughing, harrowing, growing crops, rotation of crops, &c., and furnish progress reports at the monthly meetings.

WESTERN DISTRICT.**Colton, November 1.**

(Average annual rainfall, 16in.)

PRESENT.—MESSRS. PACKER (chair), S. W., P. P., AND D. KENNY, SHEPHERD, AND McBEATH (HON. SEC.).

CARE OF FARM STOCK.—The Hon. Secretary read a paper on the necessity for proper care of farm stock, to the following effect:—Where horses, cows, or sheep are kept the best animals possible should be obtained. Feed for horses should be suitable both for the constitution of the animal and the class of work to be done, and must vary accordingly. Water—good, clean, and abundant—must also be supplied. A most important matter is harness. This should have special attention, and the collar should fit comfortably and be kept for the sole use of one animal. It should be frequently brushed and oiled. The next in importance is the driver. No hasty or ill-tempered man should have charge of a team of horses. Two minutes' exhibition of temper will often do more harm to a horse than the remainder of his life can remedy. Young stock should have quite as much consideration in the matter of feeding as the hardest worker, as the youngster is to be built up to take the place of the present worker when his time comes. Shelter, both in winter and summer, should if possible be available. Cows also need feeding well, and should be milked regularly; and again good temper and care should be exercised. In the discussion which followed members considered the Suffolk Punch horse and the merino sheep the best for the district.

Cummins, October 23.

PRESENT.—MESSRS. COOPER (chair), SABEY, BROWN, FARMILO, HALL, NOSWORTHY, R. AND W. H. SIVIOUR (HON. SEC.).

CARE OF HARNESS.—Mr. Hill's paper on this subject was read and discussed. The paper ran as follows:—“Toolittle attention is paid to harness. The one thought isto get as much out of the horse with as little feed as possible, and as much out of the harness with as little done to it as possible. This is very poor economy, as a little more feed for the horse and a few more shillings spent on the harness at the right time would mean a good many pounds saved in the end. The winkers soon get out of order. It is bad to have them too open, as the horse gets cunning and watches the driver. It is also bad to have them too close, as this frightens the animal. It is often hard to get them to fit on account of a short link which joins the off side bit ring to the ring in the winkers. It holds the bit too tightly against the mouth, and often causes a sore. I find it best to cut the link out and put a long split-link or strap in. When not in use hang the bridle up by the head piece and do not throw it over the peg anyhow, as all such usage helps to knock it out of shape. Two sorts of collars are used in this country—the pipe and the round-throat collar. The former is the best for all use. It is not only a better fit, but keeps its shape better. The collar should be buckled just tightly enough to allow it to be moved up and down the horse's neck by taking hold of it at the top and bottom. It should be just long enough to keep the horse from choking. More sore shoulders are caused by having the collar large than too small. I do not favor false collars. They can be done without, as they do not tend to make the collar fit. It is very often necessary to chamber a collar by making a straight cut in the lining and removing some of the stuffing. This will not damage the lining, and the cut could be stitched up with thread after the sore had healed. It is a good plan to have a piece of hoopiron always handy to clean the collar; also a piece of stick about 18in. long and 2in. diameter to tap the collar lightly along the side, just to move the stuffing

before putting it on, so it will give a little to the horse's shoulder. Care should be taken not to move the straw, for when the straw is once moved the collar soon goes out of shape. When not in use the collar should be buckled tight and hung up. Where a number of horses are kept it is wise to keep each one's collar distinct. The hames should fit the collar, and not be buckled tighter than is necessary to keep them in their place. The adjustment of the hames to the collar has a good deal to do with sore shoulders. They should never be made to hold the collar on, as by buckling the hames tight it will pinch the horse's neck. The spider is the best for wagon work, as it keeps the chains up and the spreader in position, whereas the back band allows them to drop down, and in backing, the horse is liable to get its legs over. The spreader should be kept as close up to the horse as possible, just allowing room for it to walk without rubbing. The chains should be all of one length, so that if they are removed at any time there will be no necessity to pair them out." In reply to a question asked by the chairman as to the remedy for a riding saddle hurting a horse's back, Mr. Hill suggested a good horsehair pad, made by spreading the hair out and making it thicker along each side of the backbone. Then use a crotchet needle, made from a piece of wood, to work it together.

BREAKING HORSES.—In reply to a question, members said two years was a good age at which to break in young horses, provided they were not worked too hard the first year.

Koppio, October 28.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), G. B., F., and M. Gardiner, Brennand, Newell, Roberts, F. and R. Richardson (Hon. Sec.).

HAY AND HAYMAKING.—A paper dealing with this question was read by Mr. Gardiner, as follows:—"This is a subject which could easily have a good deal more attention paid it by those who have any stock to feed where the natural herbage is insufficient for requirements. There has been a good deal of argument on the question of oaten *versus* wheaten hay, and of the two, for all round feeding purposes, I prefer the wheaten. It seems a hard matter to get oats cut at the right stage to make nice hay. Some varieties, when cut a little green, go bitter, while some of them seem to lose most of the corn if cut ripe enough to get over that trouble, in the handling, carting, stacking, etc. Then, again, if one does not possess a chaffcutter, or happens to have an accident with it, the stock will not do so well, and will waste a good deal more oaten hay than wheaten. I should advocate cutting wheaten hay fairly green about a week or ten days after the blossom had fallen off, and to stack green in big stooks so as to expose as few sheaves to the sun as possible. With big stooks it may require to stay out in the field a little longer, but, with the better quality of the hay and with the extra weight, I think it pays. When carting hay it should be handled as carefully as possible, as the nicer the sheaves are the nicer looking and better the stack can be built. When building the stack keep the middle full, above the edges a little, so that if it should rain when the stack is half finished, the rain will not run in more than a sheaf or two deep, and these can easily be thrown off to dry. For hay wheat in this district my first choice is Gallant. It is solid straw, grows tall, and is said to have a greater percentage of sugar than other wheats. Other hay wheats are Majestic, Silver King, Marshall's No. 3, and bearded wheats, while there are several others that do well in different localities. Hay cut green and oats given with the chaff is a very satisfactory way of feeding. If the grain is left to mature before the hay is cut it often gives stock too much grain, and the farmer does not know the amount. It is a good plan, if the farmer has a heavy crop, to cut 20 tons or 30 tons more than he estimates he wants at the start of the season, as one never knows when there may be a scarcity of grass, and such an amount of conserved feed, even in the way of hay, or, perhaps better, as ensilage, would go a long way towards making up the deficiency." An animated discussion followed, members agreeing with the paper on most points, although most of them preferred the long stack to the round one. One member said he liked to mix oats with the wheat for a hay crop.

ANNUAL MEETING.—The Hon. Secretary's report showed that ten meetings, including two homestead meetings, had been held during the year, with an average attendance of nine members out of 15. Numerous interesting and instructive papers had been read and discussed.

Penong, November 13.

(Average annual rainfall, 12½in.)

PRESENT.—Messrs. Shipard (chair), Bennier, Olsen, Wold, Farrelly, Edwards, Kalmar, Kreig, Oats (Hon. Sec.), and two visitors.

WELL-SINKING.—Mr. Wold read a paper on this subject. Every farmer in the district should have a well. He would choose as a site a stony rise running east and west, with plenty of small holes in the stone. The presence of prickly bushes also might be looked

upon as a good indication of water. The method of drilling and sinking the well was described, and hearers were advised to beware of going too deep and tapping the salt water. If sufficient water could not be obtained at the right level a drive was recommended. The fresh water was usually 3ft. above the salt water. Where a reasonable supply of water was procured it would pay to build a tank of about 5,000galls. capacity and to erect a small windmill. In the discussion which followed Mr. Bennier thought more should be done in well-sinking in this district; Mr. Edwards intended to try for water on his farm at some future date, and thought others could do so with advantage. The Chairman said that the old plan over here had been to sink on stony rises, and he thought it a good one, and found less rock there than in the hollows. With Mr. Wold, he favoured sinking on those rises running east and west. Personal observation led him to believe that there was a valley of water from Fowler's Bay district to Lake McDonell, near Point Sinclair. Water found in the hollows was not so fresh as that found on the rises.

Petina, October 30.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Penna (chair), Warf, J. and D. T. Kenny, H. A. and W. Trezona, Souter (Hon. Sec.), and six visitors.

HOMESTEAD MEETING.—This meeting was held at the farm of Mr. Warf, and the first inspection made was that of a thick crop of rye, 3ft. 6in. in height, which had been put in to stop a sand drift. The result had been very satisfactory, between 40 acres and 50 acres of drift having been stopped. The plots devoted to experiments with manures were visited, and it was evident that some of the manures were not suited to the district. Those treated with mineral super. looked most promising. Mr. Warf considered Federation and Yandilla King the best wheats for his farm.

HAYMAKING.—A paper on this subject, written by Mr. A. J. Howard, was read by the Hon. Secretary, as follows:—“ Hay should be cut with a binder if the land is clear. By this method there is less waste on the ground and in the stables. Hay is free from sticks and dust, and labor is saved in carting and stacking. It also keeps in better condition and does not get brittle. Make sure the machine is in good working order at least two weeks before it is wanted; and when cutting is over, put it in repair ready for next year, before forgetting what repairs are needed. The machine should cut clean and low, because the bottom of the stem is valuable. Wheaten hay should be cut when the grain is about half formed; at this stage the bottom part of the stem will be white. Hay cut at this stage will be of even quality from one end to the other, so that the stock will not waste any. Mice will not trouble the stack because there is only a very small quantity of grain. Oats should be cut when the bottom of the stem is brown; if cut before this the hay is liable to be sour and harsh. Loose hay should be raked a few hours after it is cut; and if the weather is hot and dry, immediately cocked. Sheaved hay should lie on the ground for at least 24 hours. Round stools are easiest to make, and if they contain not more than 30 sheaves, rain will not get into them. Hay should be carted as soon as it gets brittle in the joints; if left in the paddock after this it loses weight and quality. In building stacks keep the middle high and the sides either upright or leaning outwards so that dripping water will clear the sides. Put down plenty of damage and build the stack end on to the weather. Where water is scarce put the hay under a shed with a good iron roof, as the water from such a shed will well repay for the trouble and expense. The hay will then be safe from rain and wind.” Mr. Warf was thanked for his hospitality, and the meeting closed.

Shannon, October 30.

PRESENT.—Messrs. Neate (chair), H. and W. Glover, W. M., L. B., E. B., and W. M. (jun.) Smith, M. and J. Cronin, Fleming, Kain, Williams, J. J. Cronin (Hon. Sec.), and four visitors.

HAYMAKING.—The Hon. Secretary read a paper on this subject as follows:—“ The great secret of cutting good hay is - first, to have the binders in good order, and have them out of the shed and overhauled two or three days before you want to start using them. A few extra fittings of the most used parts should be on hand. One hot, windy day, when the hay is ready to cut, will take at least 5ewts. off an acre of hay, and when hay is £3 per ton the price of a new machine is soon lost. I think King's Early is a very good variety to sow for hay in this district, as it is a splendid weighing hay, and always grows to a fair height. Some farmers think that bearded wheat is injurious to horses, but this has not been my experience. I have seen horses fed on it without any injurious result. Yandilla King is also a good hay wheat. It has a fair amount of flag, and grows to a good height. Another variety I would recommend is

the old Purple Straw. This was one of the best wheats for hay in its day; but, like a lot of good old things, it has gone out of date. One disadvantage about it is that it is not rustproof. The best time to cut hay is as soon as it has finished growing. Examine the head carefully, and see when the grain is nice and plump. You will then have a fair amount of grain in the chaff. Of course for market it is important to have green chaff; but as there is not much probability of any of us selling much chaff, it is in our interests to have hay and chaff suitable for our own stock. Oaten hay has proved a great favorite in this district, the chief reason being that it grows to a fair height, which is necessary in new land, as it is always fairly rough, and about 6in. has to be left on the ground. It is important to cut oats at the right time, when they are turning color, as they are very bitter if cut too green. I would recommend cutting an equal amount of oaten hay and wheaten hay, and mixing it in the chaffcutter. Hay should be stooked as soon as it is cut. Make the stooks long and narrow; put two sheaves standing against each other, and then one more on each side, thus making the stack four sheaves wide. In this manner the sheaves always keep a nice shape, are good for carting and stacking, and any amount of rain cannot hurt them. Put from 25 to 30 sheaves in one stack. Stacking can be commenced about a fortnight after the hay is cut according to the weather at the time of cutting. If the hay is cut in dry, hot weather, it can be carted sooner. Everybody is anxious to get it into the stack as soon as possible, and very often a serious mistake is made in stacking too soon. Put a good layer of stumps under the stack, and stack with the butts outwards. Keep the middle well up, so the sheaves have a good dip. Stack all the sheaves in the same manner; for instance, don't stack the outside layers with the hand and the inside with a fork, or when the stack settles down the inside will go down lower than the outside, and let the rain get into it. Lastly, in covering a stack, don't simply throw straw on with a fork, but straighten the straw out like a sheaf of hay; start on the bottom and work up layer after layer, always overlapping the same as building a stack. A stack of sheaved hay, properly built and covered, will last for five or six years, and be just as good at the end of that time as when it was put there." Mr. Glover was in favor of always stooking sheaves on the flat side, as they always kept a nice shape for carting and stacking. Mr. Fleming advised salting hay in a stack—about a kerosene tin of salt to a ton of hay; it was a good preventive for mice, and kept the hay in good order. The Chairman had found that bearded hay did not harm stock, as was the opinion of most people; on the contrary, he had known stock to prefer it, and the mice certainly did not like it.

Utera Plains, October 23.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), Venning, West, Gale, Barber, Hill, J. and M. Abrook, Hornhardt, Ramsey (Hon. Sec.), and three visitors

HORSE STOCK.—Mr. West read a short paper on the general question of farm horses. He was very impressed with the Clydesdale; but for a useful farm horse preferred the Suffolk Punch. Mr. Abrook also favored the Suffolk Punch, but pointed out that the Clydesdales were bringing the highest prices. The Branch favored compulsory veterinary examination of all travelling stallions.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Coonalpyn, October 29.

(Average annual rainfall, 17 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Hill (chair), Fidge, Bone, Venning, Allengame, and Cavenagh (Hon. Sec.).

MALLEE SHOOTS.—The Hon. Secretary read a paper on how best to kill mallee shoots. Ploughing with plenty of draught on and pulling out the stumps was the best way to get rid of the shoots. For those that were left it had been found that cutting in February and March and twice again at six months' intervals was the best procedure. The best implement to use for the work was the grubber. Members all favored the grubber; but Mr. Fidge contended that after being cut in February or March the shoots would not have started growing again in six months. He also thought that mallee shoots were more easily killed on ground that had not been cultivated than they were on soil that had been worked.

Geranium, October 30.

PRESENT.—Messrs. M. Alford (chair), O'Loughlin, Cochrane, W. and W. J. Mitchell, Leahy, Weidenhofer, Watkins, Wendelborn, Gurr, Sheridan, Hammond, Foreman, F. S. Alford, Jones, Abbott, Cooney (Hon. Sec.), and three visitors.

FEEDING OFF CROPS.—Mr. Watkins read the following paper on this subject:—"In a new district such as this feed was not too plentiful. Farming being carried on on an extensive scale, a large number of horses had to be kept, and very few farmers had cleared land to graze them on. They had not been there long enough to leave out stubble land for feed; consequently, as soon as the wheat was above ground farmers were tempted to put their stock on the wheat in the certainty that they were effecting a saving in horse-feed, and the hope that the crop, particularly the early-sown varieties, would benefit by the feeding down. Some of the earliest varieties of wheat, if left alone, were likely to be rather forward, and might suffer from frost when coming into ear. Farmers fed their crops off until September last year, and improved the yield by doing so. The practice had not, however, had that effect this year. In a season such as this one he did not think it advisable to put stock on the wheat at all, the winter having been so wet the wheat did not need checking. Further, in loose land during wet weather stock pulled up a lot of young wheat." The paper was well discussed. Mr. W. Mitchell, while agreeing with the writer, and holding that heavy stock should not be allowed to feed off the crops, said that sheep might, sometimes very profitably, be allowed on the crops. Mr. Gurr did not agree with feeding off at all. The Chairman quoted an instance in which the crops had benefited by being fed off. Mr. Cochrane also considered it a wise practice under certain conditions.

Lameroo, October 23.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Wittwer (chair), Eime, Hannan, Gibbon, W. and F. Thyer, White, Jeffry, Ross, Marshall, Leckie, Kentish, Tyler, O'Connor, McMahon, R. B. and A. J. A. Koch (Hon. Sec.), and seven visitors.

FARM MANAGEMENT AND ECONOMY.—Mr. Thyer read a paper on this subject. He pointed out that it could not be supposed that hard times would never come again in this State, and therefore farmers should be methodical and economical in their work, so that they might be the better able to withstand a time less favorable than this. The paper continued—"The protection of all implements will save great expense in the course of a few years. All harvesting machines should be kept in a good substantial shed, and should be overhauled and kept in order so that you can go straight to work with them. When putting up a shed put good material into it, and do it neatly and well. It will pay to have a proper place for all harness, and to give it a coating of oil occasionally. A most important item is feed for the stock. The horse is the worker of the farm, and it often happens that the supply of horse feed runs short owing to carelessness and neglect, while there is an abundance of feed. The idea of saving and carefully stacking 'cocky chaff' does not seem worth while. When building a haystack put down a good straw foundation; it will save a good many tons of hay; and the top of the stack should be well covered. A farmer should not think that instead of paying a good price for anything he can do better and save money by going for the cheap article, because in nine cases out of ten a cheap article is more expensive in the end. After harvest there is usually a good deal of waste grain to deal with, and this can frequently be turned into money by keeping a good breed of fowls or pigs. It often happens that a farmer has a quantity of heads after a damp harvest and puts it in a heap for pig feed only. If he would take the trouble to thresh the wheat out he could perhaps buy as many pigs as it would feed for six months." The writer then urged thoroughness in constructing fences, care of secondhand bags and other things which might be useful later on. Mr. Pascoe's paper on the same subject (see page 267, October *Journal*) was then read, and a good general discussion followed. Mr. McCallum's paper on "Economy of Time" (page 257, October *Journal*) was also read and discussed.

Mannum, November 8.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Walker (chair), Fachrmann, Scott, Arnold, Schulze, Lenger, and Schutze (Hon. Sec.).

PEACH TREE DISEASES.—Members reported that curl-leaf and peach aphid had been very prevalent this season. The Hon Secretary has since observed ladybirds in thousands which have quite destroyed the aphid.

DRY WEATHER.—Owing to the dry weather experienced just prior to this meeting, several members reported that they had to cut some of their best wheat for hay.

Renmark, October 29.

(Average annual rainfall, 11in.)

PRESENT.—Messrs. Waters (chair), Weste, Basey, Nuthall, Braund, Muspratt, Geniste, Pike, Philpot, Smith, Pitt, and Cole (Hon. Sec.).

RECLAIMED SWAMP SOIL.—Samples of soil from the reclaimed swamp areas at Murray Bridge were tabled by Mr. Waters. One sample from near the river's edge had set like coal, and was of a coal-black color, but samples from the cultivated areas were without weight and were classed as pure peat, but were of a more open texture than Irish peat. Mr. Waters stated that a fire started on this soil will burn down for 1 ft. below the surface. Mr. Waters spoke in high terms of the system of irrigation and drainage in vogue on the reclaimed areas. Ditches were filled and the land flooded by opening sluice gates and the water was afterwards pumped back into the river. The rate charged was 7s an acre. Disc harrows were used instead of ploughs.

LUCERNE HAY.—Mr. Waters mentioned that lucerne grew splendidly on the swamp areas, and that on the Government Experimental Farm at Murray Bridge he had noticed lucerne being carted in to the stack in a green state. The plan adopted was to cut in the morning, rake in the afternoon, and cart next day. Members thought such a system would be all right in the hot weather, but if followed at other times the hay produced would be too mouldy for horses, though good enough for cows. Mr. Muspratt remarked that the only man he had known in Renmark who made a practice of carting in green lucerne to the stack had been Mr. Charles Chaffey, and he used to put a lot of salt with it. Mr. E. E. Smith stated that he always liberally sprinkled his lucerne in the stack with coarse salt. The hay kept better, and stock liked it better when salted. Mr. Waters used brine instead of dry salt.

Sherlock, October 30.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Osborn (chair), S. and R. H. Stringer, Nock, Coombe (Hon. Sec.), and two visitors.

HAYMAKING.—Mr. S. Stringer read a paper on this subject as follows:—"The most suitable time to cut hay is when the straw is quite white up to the first knot. Cutting hay in this condition a nice-colored sample will be obtained, with a fair amount of corn in it, and my experience has been that such hay will always command a good price. Hay should not be cut too green, as it is liable to scour the stock to which it is fed. In stooking, the sheaves should be stood in round stools of from 35 to 40 sheaves. Placed in this way they keep greener, and allow the grain to fill out a little more. Stacking should be started as soon as the straw will break, which should be between seven and ten days from the time it was cut. I favor building stacks with round ends, as it is less trouble than square ones, and equally effective. For this district Steinwedel is one of the best wheats to sow for hay." Members generally agreed with the views expressed.

SOUTH AND HILLS DISTRICT.**Cherry Gardens, October 26.**

(Average annual rainfall, 33in.)

PRESENT.—Messrs. A. Jacobs (chair), T. Jacobs, C. and I. Ricks, Hicks, C. and J. Lewis, Chapman, Lavington, Stone, Brumby, Curnow (Hon. Sec.), and two visitors.

Cows for the Hills.—Mr. I. Ricks read a paper on this subject. He considered it was a mistake to have large cows in the hills, and preferred medium-sized animals because they could get about better to feed. For local requirements crossbreds were better than purebreds. The purebreds needed more attention than the crossbreds. The Ayrshire-Jersey crosses produced a good forager, giving good butter. It would pay in this district to have sheds for the cows, and keep them in during June, July, and August, and on any odd bad days. The increased comfort provided in winter would result in an increase in milk and butter. In this way the cows would soon pay for the sheds, and it would take less food to keep them warm, I

wss a mistake to stock with cows heavily unless prepared to grow green feed. Nevertheless, it would pay to do this. A good plan was to divide the land into two or three paddocks so as to give the cows a change. The feed would be better and thicker as a result. He liked a cow with a straight back, a thin tail, and a square-shaped udder with teats evenly divided. There were also other points to consider. It paid, he said, to treat cows kindly, especially when milking them. In the discussion which followed, Mr. Currow agreed with the subdivision of the paddocks. Mr. C. Ricks thought Ayrshires were the best for the hills, as they were good climbers. Mr. T. Jacobs agreed with the paper generally. He liked the pure-bred Ayrshire best, but disliked the small teats. He also liked the pure-bred Jersey, but they did not stand the severe winters in the hills well. He therefore considered the cross between the Jersey and Ayrshire to be the right one for this district. He did not think that housing was necessary, as he had found that even on very cold nights the cows did not visit the shelter-sheds. Mr. A. Stone also liked the Ayrshire-Jersey cross, and thought that the breed of cattle in this district had been much improved since the Agricultural Bureau had obtained a pure-bred Jersey bull some years ago.

PREVALENCE OF SNAKES.—Mr. Jacobs reported that he had found snakes very plentiful this season, and on one occasion had found a large one devouring the fledglings from a ground lark's nest. This was regrettable, as the larks are valued insectivorous birds.

IRISH BLIGHT.—Mr. Ricks wished to know if there were two kinds of Irish Blight in potatos; if not, he was confident we had not seen the blight in South Australia. He had seen the blight in England, and was speaking from experience. He said that the blight never attacked the plants in England until the flowering period, but he had noticed in South Australia that it was reported to affect the plants when only a few inches high. Members thought that Mr. Ricks was mistaken, and that the evidence of the scientists in Australia was overwhelming. [Unfortunately there is no doubt as to the presence of the genuine Irish Blight in some parts of the State (and the other States). It should be remembered that vegetation, whether parasitic or otherwise, does not always appear the same or behave in the same way in climatic conditions which are entirely different from those in which it has previously been observed. This fact may greatly mitigate the trouble in South Australia.—Ed.]

Clarendon, November 2.

(Average annual rainfall, 33½in.)

PRESENT.—Messrs. White (chair), A., A. A., and E. Harper, Spencer, Piggott, Burpee, Morphett, Phelps (Hon. Sec.), and two visitors.

TREE AND STUMP PULLERS.—The Chairman and Mr. Morphett reported on a trial of a tree-puller and a stump-grubber. They considered the work done was very satisfactory. At a future meeting the Branch is to consider the question of purchasing one of these machines.

KING'S EARLY WHEAT AND SORE MOUTHS.—Commenting upon a paper read at the Congress members expressed the opinion that the beard of King's Early was the cause of sore mouths in horses. They favored Gallant's Hybrid and White Tuscan for this district.

Forest Range, November 25.

(Average annual rainfall, 36in.)

PRESENT.—Messrs. Vickers (chair), Rowley, Waters, Green, Tribe, Monks (Hon. Sec.), and one visitor.

ESPALIERS.—A paper on this subject to the following effect was read by Mr. Vickers:—“In some of the more exposed counties of England it is necessary in order to grow fruit successfully to have shelter, and for this purpose on the estates of the more well-to-do people gardens are enclosed with fairly high stone or brick walls. This may seem in our more favored climate very expensive, and I would not advocate any such expense here, but I often wonder whether we could not by the espalier, or trellising, system both improve the appearance of our gardens and also benefit financially. A short time ago, when travelling through Paracombe Estate, I found that the land was cut up into blocks with a small frontage, and it appeared to be nearly all fences. I think it would pay these blockers if the fences were utilised in the same manner as the stone walls round the gardens in England. There could be an agreement amongst neighbors as to whom each boundary fence should belong, and all division and yard fences could be made use of in the same manner. The fruit that I would advocate growing on this system is the pear. In

the near future a large quantity of this fruit will be exported to Europe. Some of the varieties, such as Keiffel's Hybrid and others, are very upright trees if grown in the usual way, and these require drastic pruning each year in order to make them spread. In my opinion we could get as much horizontal growth (which is undoubtedly the best bearing wood) on quarter the number of trees under the espalier system. I fully believe it would pay to erect fences for this purpose. They should have fairly substantial posts, not more than 8ft apart, and No. 6 galvanized wire. The trellises could be about 10ft. apart, but it would not be wise to plant closer than 30ft. in the rows. The cultivating, spraying, and picking could be done in far less time than under the present system, especially if the trees were kept somewhere about the height of an ordinary fence. Under normal conditions it is not advisable to train the top branches horizontally at once, as this causes a lot of growth at the top of the stem. If left for a year or two a little higher and brought gradually down, much better results will be obtained. A still better system, and one that looks much nicer, is to let the branches grow from 2ft. to 5ft. horizontally, and then about 18in. of vertical wood, and then horizontally again. This may be continued as long as the height of the fence will permit, and will obviate the abnormal growth at the top of the stem, as the branches, being higher, will take most of the sap." In the discussion which followed Mr. Waters thought the subject matter of the paper very interesting. He had seen apple trees treated this way in the old country in corners of orchards. Particularly for ease of spraying, picking, and cultivating the system was hard to beat, and he intended to try it. Mr. Monks thought that an ordinary wire fence was too low, and that twice the height, say 8ft., would not be too high for picking the fruit, &c. Mr. R. Green asked if wires would not cut or bruise the limbs. He considered two branches each side quite enough to build up each tree for these purposes. Mr. Rowley thought a tree could be allowed to send out branches anywhere on the stem, provided they did not interfere with the balance of the trees, and could be pulled into shape easily. He also thought wires could be so arranged so that no cutting or bruising of limbs would result. Branches could be tied to the wire. He was afraid some sorts of pears would be hard to train, as it would be difficult to get the shoots to come where they were wanted. Mr. Tribe thought 18in. would be close enough for the branches to be trellised, as if they were closer the fruit might be bruised upon the under branches. He also thought that stakes would be quite sufficient for training limbs where required.

Hartley, October 25.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Wundersitz (chair), Stanton, Hudd, G. and T. Phillips, W. and C. Brook, Pratt, Paech, Clark, and Bermingham (Hon. Sec.).

HOMESTEAD MEETING.—Members met at the residence of the secretary and inspected a small paddock of Federation wheat grown on fallow land, which was looking very well. A few acres of Price's Prolific was estimated to return 3 tons of hay to the acre. This was grown on fallow; 20 acres of Federation close by, grown on stubble land, looked very poor. Pratt's Purple Straw, on fallow land, was a nice crop for hay, there being a lot of wild oats in it. This crop was estimated at nearly 2 tons to the acre. The crops on stubble land were very poor. The next farm visited was Mr. Hifferd's, and here Federation wheat was much in evidence, again being on fallow land. It looked very well, and should go 20bush. to the acre. The chairman's was the next farm inspected. A few acres of Yandilla King, worked on the dry-farming principle, was a wonderful crop for hay; it should return 4 tons to the acre. Close by was a crop of Huguenot quite 6ft. high in places, but rather uneven. Members were much interested in this wheat, as it is new to the district. Mr. Stanton's was the next place of call, and members were here entertained at dinner. The crops were afterwards inspected. Federation wheat and Cape oats were looking very well; not very high, but promising a good yield. Passing on, the visitors came to Mr. Hudd's property. The fallow land here, which blew away so much last year, was looking fairly well, better than the owner expected considering the amount the wind had shifted. At Messrs. G. and T. Phillips' farm a paddock of 250 acres of new land fallowed looked remarkably well. Marshall's No. 3 wheat especially was a fine crop, although perhaps rather high for wheat. The last place visited was that of Messrs. W. and C. Brook. Here again the fallow was looking very well. The draught mares and foals on the property were much admired by the visitors, and it was observed that there was an abundance of feed. Members were entertained here at tea, and all felt that throughout the day they had had a most instructive time.

Kanmantoo, October 22.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Lewis (chair), Downing, W. G. Mills, Lehmann, and W. Champion Mills (Hon. Sec.).

ENSILAGE.—A discussion took place as to the best means of weighting down ensilage. Mr. Lehmann had tried soil on top of straw, but it became mixed with the ensilage when taking it out of the pit, and was unsatisfactory. Mr. W. G. Mills considered the most satisfactory weights for this purpose were heavy posts placed on the straw. They were clean and easily moved.

Kingscote, November 2.

(Average annual rainfall, 18½in.)

PRESENT.—Messrs. Turner (chair), Jacka, Campbell, Tetzlaff, Mitchell, Thorpe, Castine, Wright, Wallace, Cook (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of the chairman, and an inspection was made of the whole farm. The first crop visited was of Jacobs' No. 5 wheat, and this was estimated to yield 30bush., and the next plot, Jacobs' No. 7, looked as though it would return even more than that. The damage done by caterpillars was seen in a paddock in which Federation had been sown - there was nothing of the crop to be seen. The barley crops were also inspected. A plot of 15 acres of spring barley was estimated to yield anything between 50bush. and 70bush. per acre. Three acres put in without manure looked almost as promising as the manured portion.

AGRICULTURAL SHOWS.—Mr. Castine read a paper on this subject to the following effect:—“ Agriculture of the present day necessitates considerable study and experimenting, and farmers should eagerly grasp every chance of improving their knowledge of the work which they have made their life's calling. Various forms of gleanings such knowledge are available, and prominent amongst these stands bureau work, but in my opinion nothing tends towards the education of the farmer quicker than the holding of agricultural shows. Perhaps in no part of this State is there any community that would benefit more by the holding of a show than would the people of Kangaroo Island. In this district, where the farming community is scattered and settled over such a considerable area, with in most instances miles of scrub between each homestead, one farmer hardly knows what his neighbor can and does grow, and grows profitably, on similar land to that which he is still experimenting with, and an immense amount of good would result from the exhibition of farm produce, whether horses, cattle, or sheep, wheat, barley, oats, or vegetables. Especially would this be the case if in conjunction with the show a trial of implements could be arranged, to bring to light the implements best suited for converting our immense tracts of desert scrub into profitable land. Shows foster competition and healthy rivalry and increased experimenting to produce the best class of article, thereby enriching not only the prize-winner, but the farming community generally. The object of the bureau is to improve, if possible, the conditions of farming in the district; it is therefore evidently our duty as members to use every effort to bring about that result. That our lands are as well suited for the work required as are those of other parts of the State is quite beyond doubt. It is hardly necessary to allude to the winning of the world's championship for barley by the chairman (Mr. J. Turner); and, apart from grain, it is almost impossible to mention any product of agriculture—fruit, vegetable or stock—that has not, at one time or other, been produced here to equal anything seen elsewhere. Certainly these examples have been rather few and far between, but they have been produced, and what then is more likely to make their production general than the competition attracted by a show? And also what surer and quicker means is there of demonstrating our defects, and, I hope, remedying them, than show competition? The matter of judging at country shows is generally a fairly troublesome one, but it is quite possible that arrangements could be made with neighboring branches of the bureau to obtain the services of certain of their members to assist in carrying out these important duties. Also the time and place of holding ought easily to be arranged. Personally, I consider it would be a splendid chance of showing Kangaroo Island in its best light and a golden opportunity for visitors to see what we really can produce, and therefore it would be as well to consider the possibility of having it on a public holiday in the summer, when visitors from the mainland would be able to make an excursion trip from the city, spend a couple of hours at the show, and return home the same night. This would mean also a consideration from a revenue point of view.” The paper was favorably commented upon, and, after some considerable

discussion, Mr. Campbell moved that a special meeting be held to discuss the holding of an annual show, to be held under the auspices of the Kingscote Branch of the Agricultural Bureau. Seconded by Mr. Castine and carried; meeting to take place on November 15th. After thanking the chairman for his hospitality the meeting closed.

Longwood, November 27.

(Average annual rainfall, 37in.).

PRESENT.—MESSRS. Nicholls (chair), Oinn, Pritchard, Vogel, Roebuck, Furniss, Coles, Hughes (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—Members met at the homestead of Mr. Oinn and were very interested in the various grasses which were being grown there. Rye grass (English Perennial), Cocksfoot, and Yorkshire Fog grown together made a nice looking crop for hay for horses; whilst a crop of Fog and Cow Grass was thought better hay for cows than the former. These were in gully land. Meadow Fox Tail was doing splendidly in the gully, growing all through the winter; whilst *Phalaris comutata* was almost perished there. On the hillsides the order was reversed, the *Phalaris* doing splendidly there. Also English Sainfoin, Cocksfoot, Guinea Grass, and Perennial rye were doing well both in gully and on hill.

ROOT CROPS.—Mr. Oinn considered mangold the best root crop to grow here.

CEREAL HAY.—For this crop Algerian Oats sown very thickly was preferred. The stems were not too strong, and carried more flag leaf than when sown thinner.

SPRAYING.—Spraying for codlin moth is quite general, and some growers are most successful with two sprays for early apples and three for late, i.e., after flowering, a week before Christmas, and at end of February for late ones.

Mount Pleasant, November 12.

(Average annual rainfall, 27in.)

PRESENT.—MESSRS. Giles (chair), Hughes, P. and J. Miller, Maxwell, and Vigar (Hon. Sec.).

EXPERIMENTAL FARM FOR THE HILLS.—Mr. Hughes read a paper, with the object of showing the need for an experimental farm for the hills district, as follows:—“From its earliest days South Australia has taken a very prominent part in the development of agriculture. A number of names may be mentioned, such as Ridley, Marshall, Molineux, and many others, who assisted in laying foundations upon which succeeding and equally able and earnest men are continually building. Inter-State neighbours and some far away places like Argentine and America have copied some of our methods and machinery, all of which should be an incentive to keep in the van of progress. Great as has been our progress in previous decades, the expansion and prosperity of the last 10 years furnish instances, especially during the last four or five years, which read more like fairy tales than sober facts. Part of this prosperity we ascribe to that which is beyond man's control, viz., copious and beneficent rains, but a good part is also due to a more intelligent application by man of ‘the bounteous provisions of Nature’—in the use of fertilisers and the more scientific working of the soil by which moisture is conserved and beneficial elements availed of. Lands which from the foundation of the State until a few years ago were considered arid and valueless as far as agriculture is concerned are now, in their season, waving fields of golden grain, a source of profit and satisfaction to the State as well as to the growers. North and south, reaching out for the Victorian border on the east, stretching far out to the west, new lands are opening up to the plough as fast as surveyors can bring them to definable areas, and in all cases proving satisfactory to those who have the grit and energy to take them up. Much of this expansion is due to experiments which have had their centre at Roseworthy Agricultural College. Results have been extended by students who have been through the College, by the lectures of succeeding professors, and by the aid of our excellent official *Journal of Agriculture*, as well as by the press. Experiments have placed beyond doubt the means by which the drier outside country may be profitably occupied. There is, however, another direction in which there is room for very extensive experiments. I refer to the more arable parts of the hills district. Is it not an anomaly that centrally situated as regards all this prosperity, there is a large area which is not sharing in it—an area which, in the early days, was considered one of the richest portions of the State, but which has not only not shared in the general prosperity, but has for years been slowly going back and out of cultivation? Land which 30 or 40 years ago gave excellent returns will now barely pay for cultivation, and has generally gone back to the

most primitive use, viz., grazing on natural grasses, and even this is not satisfactory. With mostly deep soil and a bounteous rainfall, experiments with various kinds and quantities of phosphates have proved that, however much these may benefit other parts, they are not what is required here. Various other experiments have been made, but nothing continuous or systematic, or on a scale calculated to be educational. Some sturdy old colonists object to anything savoring of assistance by the State, and would prefer to rub along even if their labors continue to give them poor results. We commend their spirit; but the other side to the argument is that if at reasonable outlay the requirements of the soil could be ascertained and its profitable working demonstrated, then not only they, but the whole State, would benefit by the addition of another prosperous area. Experimental stations are being established in places where it has been proved beyond doubt that phosphates are beneficial. It is not much good sending the sons of hills farmers to Roseworthy, because the conditions are so entirely different. The difficulties they require to learn to cope with are too much wet, with cold and boggy lands in winter, and as a consequence hard, baked lands in summer. Why should there not be an experimental farm in the hills? Up to now, so far as public expenditure is concerned, it has been one of most neglected portions of the State. If the suggestion for a farm is accepted, the questions naturally arise where should it be, and what should be its scope. No more suitable place than in the neighborhood of Mount Pleasant can be suggested, for the following reasons:—Coming by the main North-Eastern Road the country until Blumberg is reached is very hilly, but directly after passing that town the hills bear away to left and right, and, continuing along the road, the country opens out into an ever-expanding area of mostly open, rolling country, the valley of the Torrens generally, sweeping up gradually to dome-shaped grassy hills of no great height, and the same class of country continues on through Springfield and the hundred of South Rhine until the Murray flats are reached. The country which would benefit by this farm includes the greater part of the hundreds of Tungkillo, Talunga, and Para Wirra, part of Onkaparinga, the whole of the hundred of South Rhine—surely an area worth consideration. It contains good land all through, and nearly all fit for cultivation, but it needs better facilities, so that it will pay to clear the heavy timber, and a better system of husbandry to make it produce. Such a farm should be large enough to supply object lessons in the draining of land, the growing of crops on drained and undrained land, the grazing of stock on indigenous grasses, cultivated fodders and imported grasses, in the best kinds of stock for the district, and their treatment in sickness as well as in health. Fruit culture might also receive attention, and there is no reason to doubt that with efficient and economical management such a farm, in addition to becoming a centre of instruction for the whole of the district, would become a paying concern in itself, and be a valuable asset to the State. Buildings might be constructed so that, while they might be used for various purposes through the year, they could be available as a shearing centre for the many small sheepfarmers of the district at shearing time; while instruction could be given in properly classing and marketing of wools. Such a farm would be as great a benefit to the hills as Roseworthy College has been to the plains.” Members generally agreed with the views expressed in the paper.

MOLINEUX MEMORIAL SCHOLARSHIP.—The suggestion that 50 branches should each subscribe £5 towards the funds of this memorial (see page 378) was considered by this branch. It was resolved, if the Advisory Board takes the matter up, to endeavor to be one of the 50 branches to give £5; £2 was promised by those present.

Port Elliot, October 16.

(Average annual rainfall, 20½ in.)

PRESENT—Messrs. Welch (chair), Punnel, Brown, W. E. and W. W. Hargraves (Hon. Sec.).

GRAFTING FRUIT TREES.—A discussion on this subject took place. Members recommended grafting below the surface of the ground to get the best results. It was also important to graft at the right time.

HENS EATING EGGS.—The Chairman wished to know how to cure hens of the habit of eating eggs. Members recommended the use of the axe.

[There is no doubt that the foregoing suggestion would be effective, but a less drastic one would be to “blow” an egg or two and fill them with a preparation containing aloes, cayenne pepper, or some other disagreeable compounds. If these are put in the nest as baits they will

probably be effective. It should be remembered, however, that the habit of eating eggs is frequently formed because the hens cannot get sufficient phosphate of lime for building up the shells of their eggs. They should therefore be supplied with plenty of lime or broken shells, grit, &c. This will be found to greatly reduce the tendency to eat their eggs, especially in the case of fowls kept in small yards or pens.—ED.]

Uraidla and Summertown, November 1.

(Annual annual rainfall, 42½in.)

PRESENT.—Messrs. R. N. Cobblewick (chair), F. Cobblewick, Hoffmann, Kessell, Hart, Johnson, Gore, Hawke, Rowe, Collins, Snell (Hon. Sec.), and one visitor.

OIL ENGINES AND PUMPING PLANTS. Mr. Hoffmann read a paper on this subject to the following effect:—“In purchasing an engine, look for simplicity of construction, as the machine with the least number of working parts is the easiest to keep clean and least liable to get out of order. An engine of this type will use any class of kerosene, from the worst to the best. It is not necessary to have an oil pump, a charge measurer, or timing valves, &c., on an oil engine to work satisfactorily; in fact, one that does away with these appliances always gives more satisfaction to the owner than one of complicated construction. One of the chief troubles of oil engines is overheating of the vaporiser and cylinder. To overcome this trouble in the cylinder, do away with the water tank. That is where the trouble lies, for the water in the tank becomes overheated, and consequently overheats the cylinder. Screw a small tap in the main leading from the pump, and connect a small hose from it to the bottom of the cylinder. It is also necessary to put a hose on the top outlet of the water-jacket. By this means you can always keep the cylinder at the required temperature, which I think should not be more than 90deg. to give the best results. If the heat exceeds 150deg. the engine stops working. Every owner should know the workings of an oil engine if he wishes to be successful with it. The principle is the same in them all. There must be a certain heat before it is in a condition to start work. When the piston is on the out-stroke there is a vacuum in the cylinder. Then kerosene and air rush through the heated vaporiser, causing kerosene to be transformed into a smoky gas. Passing into the cylinder this becomes mixed with air, and forms a high explosive. The return stroke of the piston compresses this charge, which is fired at the back of the cylinder, causing the piston to move with terrific force on the out stroke. On the return stroke the burnt gases escape through the exhaust valve into the open air; thus there is only one working stroke in every two revolutions of the engine. If too much kerosene enters the engine it will soon cease working. Should this happen, reduce the compression on the springs of the oil pump, or, if your engine is not provided with one, slacken the spring on the air valve. It is much better to have the mixture a trifle poor than too rich, as it will explode better and quicker if the gas is poor. The term “horsepower of an engine” puzzles a good many people. An engine which can raise 33,000lbs. 1ft. high in one minute is called “one-horsepower.” To find out how much water an engine can pump to a given height the rule is as follows:—Supposing the height you wish to raise the water to be 100ft., deduct 20 per cent. from the power of the engine to allow for friction of pulleys, pump, piping, &c.; then divide the remainder by 100, and it will give you weight of water that the engine is capable of raising. Taking a five-horsepower engine, for instance; allow one-fifth for friction, and there is left for work four-horse-power of 33,000lbs. each=132,000 foot pounds. This divided by 100 and again by 10 to bring the pounds to gallons, gives 132galls. per minute. It is always advisable to get an engine as near to the actual horsepower required as possible. Do not be led astray by agents as they try to sell you engines, pumps, and fittings double the size of your requirements; such men have only one end in view, viz., £ s. d., and, if you are not careful, you will find to your sorrow that you have been badly beaten, and that an engine of half the power and pump to match would have answered your requirements just as well. Purchase a pump that is easy to take to pieces without removing all the skin from your knuckles in the operation, and, if possible, have a double-action pump, as it gives a continuous flow of water. Force pumps are the only kind that can be satisfactorily used in the hills. The pump should also have a large air vessel, as this greatly relieves the strain on it and the belting, &c. It is not necessary to have the pump close to the water’s edge, for 50ft. or even 100ft. horizontally will not greatly affect its working. It only takes a little longer to exhaust the air from the pipe. Do not have the pump more than 27ft. from the bottom of your well or dam. A pump will draw from a depth of 33ft., but it is not safe to try more than 27ft. for safe working. A great mistake is made in getting pipes that are too small for the pump. A safe rule is 2in. main for 1,500galls. per hour, 2½in. for 2,500galls. 3in. main 3,500galls. Another mistake is made in supposing that a tank of large diameter will give a greater pressure on the main than a small one. If the depth of both tanks is the same there will be no difference in the pressure in the mains. With two mains, one 2in. in diameter and the other 1in. in diameter, coming from the same tank, the pressure at the lower end of the mains will be alike.”

SOUTH-EAST DISTRICT.

Kalangadoo, November 13.

PRESENT.—Messrs. Crouch (chair), McColl, Vorwerk, Gibb, Earle, S. and D. W. Tucker, Hunt, Ellison, Osborne, Boyce, and Sudholz (Hon. Sec.).

BEST SHEEP FOR THE FARM.—The Chairman read the following paper:—“I will confine myself to the sheep most suitable to Kalangadoo or a district of a similar character. The farmer should have sheep-proof fences, and the result will be that he will have sheep that can be kept in any reasonably-fenced paddock. Bad fences make rogues of the sheep and bad friends of neighbors. In the selection of rams, one with a good neck and loin, wide between the fore and hind legs, and of good girth, and the buttocks of the quarters well down should be selected. A ram of this class has a good constitution, and that means a good doer. Having satisfied yourself you have a good-shaped sheep, look at the wool; but no matter how well-fleeced a ram may be, do not buy him if he has not the constitution. I have frequently seen prizes given to sheep at shows where wool, and wool only, appeared to be the consideration. Always remember that after a sheep's wool-growing days are over they should find their way to the killing-pen, and a shapely sheep will bring a better price than one badly shaped. The same may be said of the ewes, and in my opinion for the farmer of this district a Romney Marsh ram mated with good merino ewes of good size will give an ideal sheep. Even if you go in for several crosses the wool will not be too coarse or the sheep too big for the district. The Lincoln or the English Leicester ram make ideal crosses with the merino, the former especially for well-grassed districts; but for this district I do not consider it advisable to go past the first cross. The English Leicester is a good hardy sheep and is of a good shape. It cuts good fleece and makes a most suitable sheep for either wool-growing or carcass. The other breeds of sheep, such as the Downs, are not the class for our district. I do not advocate Border Leicesters, for though they are a good carcass sheep and the wool is of a nice class along the ribs, the backs and belly wool is so thin in these sheep that when they are over three years old the wool clip is not profitable.”

Keith, November 2.

PRESENT.—Messrs. Lock (chair), P. A., S., W. A., and E. Crouch, Shackley, Tyner, Usher, Goodhard, Moreum, Leishman, C. and C. B. Godely, Farrant, Doll, Williams, McLean, Draper (Hon. Sec.), and two visitors.

FALLOWING.—A paper written by Mr. H. Mott on this subject was read and discussed. The writer advocated leaving the soil just as turned up by the plough, so that the sun could get at it to sweeten it. Then at about harvest time he would work it down to a fine surface. In this district he would fallow at least 4in. deep, and he recommended everyone to get at least 150 acres under fallow each year as soon as sufficient land was cleared. He emphasised the value of fallow in this district, inasmuch as it enabled farmers to get seeding done at the right time. Probably this was the chief reason for fallowing where there was no necessity to conserve moisture. In his opinion it was wiser to sow after rain than to put the seed in dry fallow. Mr. Doll liked to leave new ground open for the rain and sun to have free access, but old ground he would work well to kill the weeds. Mr. Moreum believed in working all ground well. He considered that more thorough working of the soil would result in better yields all round. The Chairman was satisfied that deeper ploughing would result in better crops. One reason was that when the land was only ploughed shallow the plant suffered from lack of moisture later on. This was partially obviated by deep ploughing.

Kybybolite, October 28.

(Average annual rainfall, 22in.)

PRESENT.—Messrs. Bradley (chair), G. H., and C. Hahn, A. R. and C. H. Scholz, Farrow, Lacey, Smith, Debney (Hon. Sec.), and one visitor.

EARLY GREEN FEED.—The Chairman, in speaking of his crops sown for early feed, said that while rye had been proved to be a very fast grower, the stock would not eat it as readily as they would barley. Mr. Scholz had fed off a portion of an early crop, but it had done no good to the crop. He believed it was fed off too late in the season.

ENSILAGE.—Following on the report of Congress given by delegates, it was thought by all that more attention should be paid to ensilage by farmers.

Mount Gambier, November 13.

(Average annual rainfall, 31½in.)

PRESENT.—Messrs. Sassanowsky (chair), Wedd, Watson, Dow, Edwards, Mitchell, Pritchard, Pick, Kennedy, Holloway, Bodey, Kilsby, Buck, Ruwoldt, Sutton, Engelbrecht, G. and D. Collins (Hon. Sec.).

DESTRUCTION OF CATERPILLARS.—Speaking of mixing Paris green with bran for destroying cutworms or caterpillars, the Chairman recommended the following method of mixing to avoid inhaling the fine Paris green dust:—Put the Paris green in a tin with a narrow mouth. Plunge the mouth of the tin into the bran and distribute the green in that way, and it will thus be prevented from flying about. The proportion used and method of distributing recommended here is as follows:—1lb. Paris green, 15lbs. of bran; the mixture to be damped with a little water to which sufficient salt has been added to make it brackish. Sow from 1bush. to 2bush. per acre of the mixture, according to the thickness of the crop.

PARTURITION.—Mr. Jas. Keegan read a short paper on mishaps connected with the foaling of mares and the calving of cows, and how to deal with them. Several of the members said it was a mistake to allow mares to become too fat just before foaling. Mr. Wedd believed the information given would be useful to many. He was very glad to have heard the paper. Mr. Edwards thought the paper was one of the most useful he had heard since the Branch was in existence.

Naracoorte, October 9.

(Average annual rainfall, 22in.)

PRESENT.—Messrs. Coe (chair), Forster, Wright, Caldwell, Langeluddecke (sen. and jun.), and Schinkel (Hon. Sec.).

FORMATION OF AN EGG CIRCLE.—Mr. L. Wright reported that, in accordance with a resolution passed at last meeting, he had made inquiries about starting an egg circle in Naracoorte, and was successful in forming one with a membership of 23 to start with, and every prospect of it increasing.

VISIT TO THE MURRAY SWAMP LANDS.—Mr. Schinkel reported on the recent visit to the Murray Bridge experimental farm and swamp lands as follows:—“Arrived at Murray Bridge, members had a great object lesson in what could be done on the swamp lands after they are reclaimed. To drain swamp lands stop banks are made when the river is low, and after the banks are completed drains are cut about three chains apart to let in the fresh water from the river by sluices when required. The soil is so porous that the water soaks very readily from drain to drain in a very short time. Lucerne seems to be the main crop, and finds ready sale to neighboring farmers at about £1.5 per acre. The lucerne is cut about eight or nine times during the year. Eight different kinds are growing side by side to ascertain which variety is the most profitable. It has been found that lucerne can only be grown close to the river, the back portion of the swamps being too salty. The salt water comes from the adjoining hills. Drains have been cut near the hills to intercept the salt water, which is taken by drains to the stop banks on the river, and then pumped out by steam power. This has given the desired effect, as it was noticed that the land so treated grew lucerne nearly as well as the frontage. In addition to lucerne many varieties of fodder crops are grown, *Panicum crus-galli* being the only fodder which grew well on the salty lands before the salt water was taken off. The seed of this *Panicum* was purchased at 6s. per pound, and from two acres they reaped 6 tons, giving 2,031lbs. of seed—a very handsome return. I would strongly advise members to try some of this on our plain lands. Seed should be sown about the end of October. The rent paid by farmers on the reclaimed swamp lands varies from 12s. 6d. to 25s. per acre. On Saturday morning, in a heavy fog, the party, accompanied by Mr. McIntosh, engaged the yacht *Mobilis* and sailed up the river to Mr. Cowan’s homestead (Glen Lossie). Here we found that Mr. Cowan had done a great deal of work in reclaiming swamp lands, having experienced great difficulty in keeping the water from overflowing the banks during the wet months. Mr. Cowan runs a dairy farm. The cow bails are very conveniently arranged, the separating being done by steam power. Vegetables are grown on a fairly large scale and sold locally. The larger portion of the reclaimed swamp lands are used for fattening purposes for about 30 sheep per acre per annum. After inspecting the various crops and stock on the flats, the visitors were invited to the homestead, where refreshments were provided by Mrs. Cowan. A turn was then made down the river as far as Wood’s Point Station, where Messrs. Morphett have reclaimed about 640 acres in one swamp, at a cost of about £10,000. Here members again saw beautiful crops of lucerne and other crops. Messrs. Morphett carry on dairying on the share system, finding all cows (which are dehorned) and other necessities, while the dairymen do all the work. Three dairies were in full swing, and each dairy was at the time of the visit milking about 85 cows. The cow sheds are nice and conveniently arranged. Each cow’s milk is tested daily. The average per cow is about 20lbs. Large strong silo pits have been built,

which are capable of holding some hundreds of tons of ensilage. After inspecting the reclaimed swamp lands and dairy, the party had a look at some of the sheep on the estate. Some of them seemed to be uncomfortably fat, having lumps on each side of their tails resembling a small football. Quite a number of the party stated that they now understood why the sheep from the river realised such high prices in the market. Before the party started on the return journey for the Bridge they got on a small hill, where they had the opportunity of seeing one of the swamps in its natural state. This was a sheet of water, and well covered with the feathered tribe, being a great contrast to the beautiful fat sheep grazing nearly up to their backs in lucerne on the reclaimed swamps. The party returned to the Bridge about 6.30 o'clock, having spent a very enjoyable and educational day." Other members spoke of the trip and reported on the Bureau Congress.

Tatiara, November 19.

(Average annual rainfall, 19 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Saxon (chair), Ross, Stanton, Prescott, Fisher, Duncan, Milne, and Truman (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. H. Milne, at Bordertown.

GRASSES.—Mr. Prescott reported on the experimental grasses sown on his property. Out of 18 varieties sown, 15 came up, but the hot wind of the past week had killed three. The clovers were the worst sufferers. Five grasses were doing exceptionally well; they were the two ryes, cocksfoot, tall oat, and tall fescue. The chicory had been doing well, but the rabbits attacked it and ate it out.

Mr. Milne submitted two specimens of Canary grass and wild oats, the former showing a stooing of 31 heads and the latter 45 heads respectively.

COMPETITION WHEATS.—The wheat plots being grown for the Government by Mr. Milne were then inspected. They were surrounded by wheat outside the competition to protect them from rabbits and birds, and divided from each other by a strip of land 8ft. wide. The wheats surrounding the plots are Federation and Purple Straw, and both varieties are showing up to advantage. The first plot visited was Western Australian Crossbred No. 53. It is a heavy straw and carries a head fully 6in. in length. It is evidently a seed that should be sown early, for the other plots are turning in color, while the Crossbred is still very green. The heads make a fine show in a field, their color being very grey and velvety in appearance. The other plots, Red and White Gamma, showed great growth and density, each plant stooing splendidly. All the plots were sowed with 120lbs. of wheat manure to the acre, and were put into the soil on the 22nd May. While it is a little early to estimate the yield correctly, opinion favored 18bush. to 20bush. per acre, with the exception of the Western Australian sample.

TREE-PULLING.—Members then witnessed an exhibition of tree-pulling by the Bunyip Forest Devil. The machine was affixed to a stout dry tree, and within a few minutes the tree was laid low. A desire being expressed that a green tree should be lowered, the devil was attached to a box tree. The strain on this occasion was greater, the roots holding tenaciously to the earth. In about 10 minutes it was felled, and then the cable was so placed as to pull the tree from its place in the earth. The work was carried out successfully, and members expressed pleasure at the exhibition. The whole of the company partook of Mrs. Milne's hospitality, and hearty thanks were tendered to Mr. and Mrs. Milne.

THE JOURNAL OF AGRICULTURE

Published Monthly.

Subscription, 1/- per annum, including postage.

Circulation, 5,300 Monthly.

THE Journal contains information of an official character relating to the Agricultural Lands, Stock, and Produce Export Departments. Illustrated articles and paragraphs by Government experts dealing with all branches of agriculture, horticulture, viticulture, pastoral matters, dairying, stock diseases, poultry, etc., are published regularly.

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E. H. COOMBE,

MINISTER OF AGRICULTURE.

THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE

OF THE

26 APR 1911

Department of Agriculture OF SOUTH AUSTRALIA.

No. 6.

JANUARY, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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All communications to be addressed:

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

The Department of Agriculture.

It should be a matter of gratification to the producers of South Australia that in the reconstruction of the Government, which took place at the end of December, due recognition was made of the growing importance of the Department of Agriculture. The title of "Minister of Agriculture" was first given to a Minister in 1875, but until now the position has been associated with some other ministerial office which was officially regarded as being of more importance than the oversight of the Department of Agriculture. At first, and for many years, the affairs of the department were administered by the gentleman who held the office of Minister of Education, then by the Treasurer, next by the Commissioner of Public Works, and finally by the Commissioner of Crown Lands. The scope of the department has been much extended during the last 10 years, especially in the recent run of good seasons; and, given similar fortunate circumstances and a Minister responsible for no other department of the Government service, the record of the next few years should easily eclipse that of those that have gone. The Hon. E. H. Coombe started out after this record, but he was in office long enough to do little more than win the confidence and esteem of the officers by the enthusiastic interest he took in their work. In his successor, the Hon. Thomas Pascoe, the department will have at its head a practical farmer, who has withstood and overcome practically all the difficulties that have faced the producers in our northern districts. Mr. Pascoe was born on his father's farm at White Hut, near Clare, on June 23rd, 1859, and after leaving school he assisted his father, Mr. Thomas Pascoe, sen., on his farms at Clare and Farrell's Flat. At the age of 16 he was placed in charge of his father's farm at Terowie, and for 34 years Mr. Pascoe has remained there. That he is regarded as a successful farmer in a district which has an average rainfall of about 13in., and which has seen many failures, is probably the best testimony that can be given of his capacity as a farmer. He has naturally taken a great interest in the agricultural problems of our drier districts, and he is a strong advocate of Campbell's system of dry farming. Farmers who are trying to make a living in the more arid parts of the State will find in the new Minister a sympathetic friend. Mr. Pascoe early took part in public matters in the North. As a young man he entered into the work of the Farmers' Association —the first political association amongst farmers. At the age of 27 he was appointed a member of the Vermin Board, which endeavored, under Parliamentary direction, to mitigate the rabbit nuisance by paying for scalps; and a year later he was enrolled as a justice of the peace. He subsequently entered

the Terowie District Council, and became chairman of it for one term. Mr. Pascoe was returned to Parliament in May, 1900, and the value placed on his opinion on farming matters is shown by the fact that he has been a member of all the Royal Commissions which have been appointed to report on the



HON. T. PASCOE, M.L.C., MINISTER OF AGRICULTURE.

opening up of new agricultural country, namely, Pinnaroo, Eyre's Peninsula, and Loxton. For the last seven or eight years he has been an active member of the Whyte-Yarcowie Branch of the Agricultural Bureau. Mr. Pascoe will occupy the old Crown Lands Office, and at present Mr. T. Duffield is acting as his secretary and Mr. W. L. Summers as his chief clerk.

The Standard Bushel.

The standard weight of the "fair average quality" of wheat for the present season has been fixed by the Corn Trade Section of the Chamber of Commerce at 62½ lbs. per Imperial bushel. The standard was arrived at in the usual way : on samples obtained from the Agricultural Bureaus and from merchants.

The decision was made on January 7th, one day later than last year; but as the weight is the same as last year the matter of the time of fixing is of little consequence. Farmers will continue to receive, as they did last year, the market rate for each Imperial bushel of 60lbs., provided that the wheat is of such quality that a bushel measure of it weighs 62½lbs. The table below shows that the average standard weight per Imperial bushel for the last 10 years has been 62·6lbs. in South Australia, 62·1lbs. in Victoria, and 61·3lbs. in New South Wales. The f.a.q. standard for the three principal wheat-growing States since 1898-9 is given in the following table:—

Year.	South Australia.	Victoria.	New S. Wales.
	lbs.	lbs.	lbs.
1898-9.....	63	62½	61
1899-1900.....	63	62½	61
1900-1.....	63	62½	61
1901-2.....	62	62½	61½
1902-3.....	63	61	—
1903-4.....	61½	60½	61
1904-5.....	63	61½	59½
1905-6.....	63	63	62
1906-7.....	62½	62¾	62¼
1907-8.....	63	62½	62½
1908-9.....	62½	62½	61½
1909-10.....	62½	—	—

The Apple Crop.

The Horticultural Instructor (Mr. G. Quinn) writes:—"The crop of apples for this season promises to be of fair average quantity and of good quality. The growers in general are using arsenate of lead as a spray against codlin moth, and very large quantities indeed of this compound, comprising quite a number of different makes, are being used throughout the State. Wherever the spraying began with the setting of the fruits the orchard inspectors report that very little evidence of the insect is noticeable. To those who have not intended to do so, I would suggest that they spray their apples and pears again in the early part of the new year, and such late sorts as Rome Beauty, Stone Pippin, Rokewood, Yates, and so forth should receive even another treatment after the ordinary export varieties have been given the application referred to. With a view to testing the comparative value of some of the arsenates of lead now upon the market, the Horticultural Branch of the department is conducting an exact test with those known as Swift's, Nicholls',

and Platypus at a small orchard near Lyndoch ; and it is hoped that by the end of the season something like definite information will be available. Even up to the present one or two points of interest have transpired in connection with the use of these arsenates, but it is not proposed to make any statement at present respecting their comparative values. There is no doubt that this form of arsenical spray is superseding all others, very largely because of the ease and simplicity with which it can be utilised, and also on account of the fact that it is less injurious to the trees as well as to the spraying apparatus than other arsenical mixtures."

Roseworthy Agricultural College.

Professor Perkins, who has been granted 12 months' leave of absence, will leave Adelaide on January 20th for a trip to Europe, during which he will make a thorough investigation into agricultural matters, visiting parts of North Africa, Asia Minor, and the principal European states. From time to time he will furnish reports to the Government for publication in the *Journal of Agriculture*. During his absence Mr. W. J. Colebatch, B.Sc., will undertake the duties of Principal of the College. Mr. A. E. Pearson, B.Sc., has been appointed housemaster at Roseworthy Agricultural College. He was born in 1883, and was educated at the Norwood Public School. Winning an exhibition in 1896, he went to Prince Alfred College, and passed the junior examination in 1897 and the senior in 1899. Afterwards he won the second University scholarship. Since then he has obtained the B.Sc. degree, and has nearly completed the requirements for the B.A. degree. He has been assistant teacher at the Adelaide Agricultural School, and has taken advanced work in several of the country public schools. His last duty under the Education Department was as head of the Gladstone Continuation School.

Departmental Changes.

In consequence of the alteration made in the office of Minister of Agriculture, the clerical staff of the department has been removed from the Exhibition Building to the rooms formerly occupied by the Crown Lands Department in the Government Buildings, King William street. Business in connection with the Agricultural Bureau, the Fertilisers Act, and the Chaff Act will be conducted from the new offices. The offices of the Director of Agriculture and of the Horticultural Instructor and Inspector of Fruit will continue to be at the Exhibition Buildings.

The Export of Wheat.

The wheat crop of 1908-9 was responsible for a huge influx of money into South Australia. The quantity of wheat exported oversea and inter-State was roughly 17,500,000 bush., and the daily average price of wheat to the farmer for the twelve months was 4s. 5d. per bushel. The wheat exported may therefore be valued at £3,864,583, exclusive of the profits (if any) made by merchants and shippers. This year, it is stated by people in the trade, that the South Australian yield will total 26,000,000 bush., and if 22,000,000 bush. are exported and the average price equals that of last year, the cash return to the State will be nearly £5,000,000.

Codlin Moth.

The Horticultural Instructor (Mr. G. Quinn) writes :—“ During the present apple season the inspectors of orchards have been actively engaged in attempting to reduce the ravages of the codlin moth; and, with a view to carrying out the requirements of the law more strictly, a great number of useless apple and pear trees in the Mount Lofty ranges have been cut down by the inspectors’ instructions. It is fully recognised that, as the law does not empower the officers to cleanse the gardens at the expense of the occupiers who refuse to do anything themselves to destroy this pest, it is only a waste of time and a danger to the surrounding orchards to prosecute such persons, and consequently the law which permits the destruction of neglected trees is being put into operation, because when the tree is removed there can be no further infection of the fruit of the careful neighbor, and in the long run the process is far cheaper for the recalcitrant occupier or owner of the useless and neglected tree.”

Anthrax.

Another case of anthrax has occurred at Wallaroo Mines amongst the stock belonging to Mr. McInerney, who himself contracted the disease last year. The present outbreak has been confined to a calf which died suddenly, and a bacteriological examination of blood from the ear revealed the *Bacillus anthracis*. Every precaution has been taken by the Stock and Brands Department to prevent the spread of the disease, and it is not expected that any further cases will occur. The present outbreak is certainly connected with the previous one amongst Mr. McInerney’s stock, and it is significant that the calf which has died is the one that escaped the second vaccination last year. When the Deputy Chief Inspector of Stock (Mr. T. H. Williams)

vaccinated the cattle for the second time last year this calf could not be found, and its subsequent development of the disease proves the value of the second vaccination under the system adopted by the Stock Department. *The Journal of the Board of Agriculture* in its November issue publishes the following paragraph respecting inoculation for the prevention of anthrax :— “The Pasteur method of preventive inoculation has rendered great service in preserving stock on badly infected farms in various parts of the world. The method consists in injecting the animals with fixed doses of attenuated cultures of the *Bacillus anthracis*. Two injections at intervals of 12 days are performed. For the first injection a very attenuated culture is used (first vaccin), and for the second a less attenuated culture (second vaccin) is employed. The immunity is established about 12 to 15 days after the second vaccin has been injected. In cattle it lasts about a year and should be repeated after this period unless the ground has become purified. The great majority of cattle operated on show little more than a temporary indisposition with passing fever after the injection, which may be assumed to indicate a mild attack of anthrax. Occasionally, however, an inoculated animal may die of the disease as a result of the injection, and for this reason the animals, while undergoing the process of immunisation, should be kept in a special paddock, or, better still, in sheds which can be disinfected in the event of an accident taking place. The operation should only be attempted by skilled persons, who will know the best way to prevent an accident, and guard against its consequences should it occur. Since the operation is not altogether unattended by the possibility of loss, and since it incurs a certain amount of expense, one has to consider under what circumstances it will be worth while undertaking it. It will be obvious that on farms registering only one death annually it will hardly be called for, and that it would be folly to adopt it on clean farms. It results from observations on several millions of cattle in various parts of the world that accidents occur in about 5 per cent. of the inoculated cattle taken all round, and that the operation may be expected to reduce the death rate from anthrax on infected farms to about 1 per cent., or slightly under. If a stockowner finds that his annual losses from anthrax amount to 2 per cent. he will possibly find it profitable to have recourse to preventive inoculation. It should be understood, however, that since the number of animals dying of anthrax in one year will vary, and since the inoculation must be repeated annually, the estimation of annual losses must be based on two or three years' casualties. A certain degree of temporary immunity can also be almost immediately conferred by injecting a dose of anthrax serum, and the injection produces no accidents. Where animals have been exposed to the risks of what might be called gross infection (for example, when a carcass has been carelessly dealt with on a pasture) it is advisable to inject them immediately with serum, and remove them to another field.”

Agricultural Scholarships at Roseworthy.

The attention of farmers and others is specially directed to the opportunities afforded to country students by the Agricultural Scholarships. These scholarships were instituted mainly for sons of farmers, but in the past there has been considerable lack of competition from country districts. Six scholarships are offered annually and are tenable for three years. For the purpose of allotting the scholarships the State is divided into six districts, one scholarship being offered for each district. The next examination will be held early in April, 1910, and intending candidates should forward their names to the secretary not later than March 1st. Candidates must be boys of not less than 16 and not more than 19 years of age on April 1st of the year of competition. Copies of prospectus containing further information regarding districts, conditions of tenure, subjects for examination, examination papers for 1909, &c., may be had on application to the secretary, Agricultural College, Roseworthy.

Fungus Pests.

The Horticultural Instructor (Mr. G. Quinn) writes :—“ During the past winter and spring the conditions have been highly favorable to the development of many fungus pests of the orchard and garden. The shot-hole fungus (*Clasterosporium carpophilum*) has been particularly noticeable in the almonds, apricots, and peaches. Specimens of the latter fruit submitted to Mr. D. McAlpine, the Government Pathologist of Victoria, were found to be badly injured by this fungus, and almost the entire crop of the Brandis almonds has been destroyed by it. It is worth observing that, whilst the Brandis variety has almost failed to set any fruit this season, other sorts, such as Hatch’s Californian Nonpareil, which blossoms from about 10 to 14 days later, were not injured as far as the crop is concerned. The foliage of Hatch’s Californian Nonpareil appears to offer considerably more resistance to the shot-hole fungus than the Brandis and other softer and more crumpled-leaved varieties. Two diseases which have apparently been favored by the season are the black spot of the walnut and the black rust-like disease of the mulberry. Both of these are due to forms of bacteria, and consequently whenever they appear all diseased portions, as far as practicable, should be cut off and burnt. The walnut bacteriosis appears to be much more persistent than that of the mulberry, and it is some slight encouragement to know that different American investigators claim to have reduced the disease by spraying the trees with Bordeaux mixture, but it is difficult to understand why this should be. The gathering up of the diseased walnuts and the cutting away of the diseased twigs from the trees and burning them most certainly destroys the germs of the disease.”

Government Produce Department Profits.

The Acting Manager of the Government Produce Department (Mr. C. F. G. McCann) reports as follows concerning the financial results of the department's operations for the year 1908-9 :—"The actual profits, after paying working expenses and interest on capital for the year, are as follows :—Freezing works, £4,061 18s. 2d.; butter factory, £504 6s. 5d., in addition to bonus of £500 to producers; total, £4,566 4s. 7d. Taking into consideration the fact that the new premises of the department were not really finished in time to allow of the full benefit of the improved and more economical methods of working being availed of, the profit realised is satisfactory. The sum of £4,040 11s. 9d. was also paid in interest on the capital expended. Taking a retrospective view of the accounts from the date of the department's creation to June 30th, 1909, during which period interest on capital has been charged, an actual loss of £1,450 13s. 1d. is shown. The accounts, however, do not show any annual depreciation debits. The earlier stages of the department's existence were to a large extent experimental. The rapid growth which the export trade has made was never anticipated, and in consequence only a limited capacity was installed. This rendered later operations in extension very expensive. An amount of £94,113 9s. 10d. has been spent in doubling the capacity of the works, and this added to the previous cost of £87,681 12s. 3d. makes a total expenditure of £181,795 2s. 1d., and gives the department the largest and most up-to-date establishment in Australasia."

Grubby Tomatoes.

The Horticultural Instructor (Mr. G. Quinn) writes :—"Grubby tomatoes have been very noticeable this season in the markets and on the hawkers' carts. This damage is caused chiefly by the caterpillar of a moth (*Heliothis armigera*), known in America as the Army worm. The caterpillar is of a dull earthy color, and grows to a length of about 1in. to 1½in. The moth is dull brown in color and is somewhat heavy in appearance, with a spread of wings of about 1½in. Flying in the evening, it deposits its eggs in groups of from two to five just on the underneath surface of the leaves. These eggs are a dull greenish-yellow color, and may be readily detected by watching the moth alight and then examining the place where it settled. Being chewing insects and attacking the tomatoes in the early portion of the season it is possible to check them almost absolutely by means of poisonous spray washes. One large grower near Adelaide has informed me that he sprayed his tomato plantation six times with arsenate of lead at the rate of 1lb. to 10galls. of water, and the plants and fruits seemed to be almost free from the pest. This spraying was done some time before the fruit-picking season, began, so that the danger of poisoning was eliminated. When tomato growers

bear in mind that it is the earlier ripening fruits which are destroyed by this insect at a time when the produce is often worth nearly £1 a case, it can easily be seen that if the damage is only reduced by 50 per cent. it would pay handsomely to adopt spraying as a means of preventing this injury."

Conference of Northern Branches of the Agricultural Bureau.

The eighteenth Annual Conference of Northern Branches is to be held at Georgetown in accordance with a resolution passed last January at Caltowie. The date fixed is February 24th, and the Georgetown Branch is hopeful of arranging for an excellent agenda paper. The usual railway concession of return tickets at excursion fares will be available to delegates from other Branches upon application being made to the Department of Agriculture. It is hoped that a good representation of other Branches will be made in spite of the fact that some will be in recess during the next few weeks.

Shot-hole Fungus in Apricots.

The Horticultural Instructor (Mr. G. Quinn) writes :—" During the past month specimens of diseased apricots which have been badly injured by the shot-hole fungus have been submitted to the department. The skin on the upper side of these fruits has cracked away, and this has occurred after the fruits had been sprayed with Bordeaux mixture, with a view to checking the fungus. The reason for the cracking off of this skin appears to be that the coolness of the season has favored the development of the fruit, and the spray, in conjunction with the fungus, has destroyed the epidermal tissue. As the fruit swelled this outer portion was forced off, very much after the manner of the scaling of bark from the limb of a tree, and a smooth, clean, brown surface formed beneath the primary layers. The apricots, beyond being somewhat disfigured, do not appear to have lost much in flavor or quality."

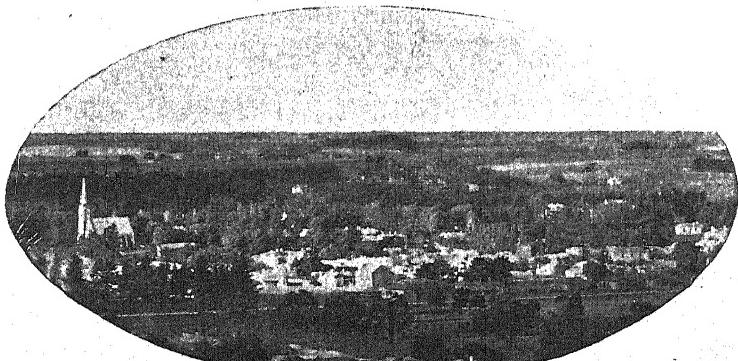
Imports and Exports of Plants.

The Inspectors under the Vine, Fruit, and Vegetable Protection Act of 1885 admitted at Adelaide during the month of November 7,996 bush. of fresh fruits, 14,499 bags of potatoes, 112 bags of onions, and seven packages of plants. Four hundred and eight bushels of bananas were destroyed, being overripe. The exports to inter-State markets consisted of 6,114 bush. of fresh fruits, 2,610 packages of vegetables, and 23 packages of plants, examined at Adelaide; in addition 414 bush. of citrus fruits were passed at

Renmark. Under the Commerce Act 633bush. of fresh fruits and 95 packages of preserved fruits were exported. These were distributed as follows:—For New Zealand, 633bush. citrus fruits and 60 packages preserved fruit; for India and East, 35 packages preserved fruits and one package of seeds. Under the Federal Quarantine Act, 1,063 packages of seeds, bulbs, plants, &c., were admitted and inspected from oversea ports.

Day and Night Growth of Plants.

In the *Journal of the National Horticultural Society of France* for June, 1909, Messrs. Nombot & Bruneau record some very interesting observations on the growth of pear scions grafted on established trees of both pear and quince. The shoots were measured each morning and evening, and it was shown that there was practically no difference between the amount of growth made during the day and during the night. Other things being equal, the greatest growth takes place during cloudy weather. Pinching back has a decided tendency to delay the ripening of the twigs.



A GLIMPSE OF MOUNT GAMBIER.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungid pests, the export of produce and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence for this department should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

DISEASES IN NECTARINE TREES.

"Billeroo," Waukaringa, writes—"In separate parcel I am sending to you some leaves of one of my nectarines. The brown spots appear first; then the leaves fall and the twigs die. Can you let me know the reason, and if you know of a remedy?"

Mr. Quinn replies—"The leaves of your nectarine are slightly affected by one of the shothole fungi, probably *Clasterosporium carpophilum*, but most of the spotting is not due to this disease. The patches of tissue appear to have been killed by some caustic action such as might result from sprinkling the foliage during the hottest part of the day with water, more especially if it contained some saline substance in solution. We would advise you to cut away all diseased and dead twigs, nourishing the tree by means of good tillage and supplies of moisture at the roots. In the autumn as soon as the leaves fall spray the trees with Bordeaux mixture made by dissolving 1lb. of bluestone in 5galls. of hot water and mixing with the bluestone solution when cold 5galls. of milk of lime made by slaking 1lb. of good, fresh, lumpy quicklime. If freshly-burnt quicklime is not procurable, use 1½lbs. of ordinary washing soda in 5galls. of water and blend this with the bluestone solution."

PACKING APPLES.

In reply to a question from a correspondent at Port Adelaide respecting the picking and packing of apples, Mr. G. Quinn (the Horticultural Instructor) writes—"The safest plan is to pick the fruits into cases carefully and carry them to the packing shed, afterwards sorting them into the packing boxes. If intended for long-distance journeys they are best packed a day or two after picking from the trees, as after the lapse of this time the skins toughen slightly, and defects or punctures on the skin are usually more readily detected. If required for immediate transport to adjacent markets they may be packed directly into the cases."

FALLING OF CHERRIES.

"Hynam" writes asking for a reason and remedy for the falling of newly formed cherry fruits.

Mr. G. Quinn replies—"Without an intimate knowledge of the climatic and soil conditions prevailing in your neighborhood I am quite at a loss to come to anything like a definite conclusion respecting the cause of the fruits falling. The flowers, owing to the absence of other sorts, may not be properly fertilised (inoculated with pollen), and fall in consequence; or the prevalence of too much wet around the roots may retard the activities of the roots in early spring when nutriment is essential to the progress of the newly formed fruits. Fungus diseases or cold winds may also operate against the setting. The above are all probable causes, and it may be possible for you to experiment in the direction of testing each one, e.g., (1) the kitchen water may be drained away from the roots until after the dry weather sets in in earnest; (2) the tree or portion of it could be sprayed with Bordeaux mixture just as the flower buds start to open, to check microscopic fungus growths; (3) if you could obtain next flowering season some fresh branches of cherry blossoms of another kind of cherry tree and brush them over the open flowers on a branch of your own tree, when possibly cross-fertilisation may be accomplished. I offer these suggestions for your consideration in the absence of a better knowledge of local conditions."

POULTRY FOR THE EXPORT TRADE.

"Export Trade," Gawler, asks, "What cross can be recommended for farmers to breed for the export trade in table poultry?"

Mr. D. F. Laurie (the Poultry Expert) replies—"There are numerous good crosses, but one of the best and most suited to farmers' requirements is the result of mating a pure White Leghorn cockerel with a number of Black Orpington hens. The progeny will all have white plumage; the legs will be white or bluish-white. The chickens grow quickly and are very plump and fatten well. The pullets are, as a rule, excellent layers. If bred from again, a variety of colors will result.

OVARIAN CYST IN HENS.

In reply to "Amateur," Mr. Laurie writes—"The trouble affecting your hen is probably due to the presence of an ovarian cyst. There is no doubt that such troubles are due to hereditary weakness, and I do not think there are more cases now than a few years ago. The symptoms you describe point strongly to this trouble, viz., a considerable abdominal swelling, with much heat and a straining motion on the part of the hen. I have performed operations, and after tapping the cyst have eventually removed it; sometimes a cyst contains a quart of fluid."

WORMS IN HORSES.

A correspondent writes—"I wish to know how to treat a yearling draught colt which appears to be hide-bound and itching. It was stable-fed during the winter on oaten hay and chaff. Worms were noticed in the stable frequently. It was then dosed with turps and milk, and for a few days discharged worms; no worms have been noticed since. At the October meeting of the Kalangadoo Branch I asked members their opinion about docking its tail in order to bleed it. A discussion followed and members arrived at the conclusion that it was not advisable to dock the tail but a change of feed was considered necessary."

The Government Veterinary Surgeon (Mr. J. F. McEachran) replies as follows:—"I would recommend the owner to give the colt $\frac{1}{2}$ pt. of raw linseed oil, and follow up with tonic and alternative powders as follows:— Powdered gentian, 1½ozs.; powdered ginger, 1½ozs.; powdered saltpetre, 2ozs.; powdered sulphate of magnesium, 2ozs.; powdered aniseed, sufficient quantity. Mix; make into 12 powders; give one twice daily in the food."



REAPING ON A LARGE FARM.

MILLING QUALITIES OF SOUTH AUSTRALIAN WHEATS.

BY W. ANGUS, B.Sc., AND A. E. V. RICHARDSON, B.A., B.Sc.

(Continued from page 387.)

Throughout the milling tests recorded last month two points are particularly noticeable—the indifferent quality of the majority of the flours and the low flour strength. So far as the question of color is concerned, it is impossible, with a small experimental mill, to produce flour of the very finest quality, such as we might reasonably expect from a large mill. In the first place we have none of the elaborate cleaning apparatus characteristic of the modern roller mill. Again, to ensure accuracy in the results the entire mill is cleaned out after each milling and the siftings consigned to their respective destinations—the flour or pollard box. The inclusion of these siftings in the flour undoubtedly interferes with the resultant good color. The exclusion of the siftings, however, may possibly interfere with other properties more important than color. But as each variety tested is treated alike with respect to color, it is possible to judge them by their relative color at least. The accuracy of the results is therefore not interfered with.

That the strengths of South Australian flour appear to be low is a matter for regret, as these low figures tend to make our wheats compare unfavorably with those of the other wheat-growing States of the Commonwealth. That this apparent low strength is due, not to the milling, but to the unsatisfactory methods of testing the flours, is amply demonstrated in the results now to be dealt with. In many quarters doubt was entertained as to the possibility of obtaining accurate results with a miniature mill such as is used in this department. To dispel this doubt from the minds of critics a large milling test was arranged. Messrs. Thomas & Co., of Port Adelaide, very kindly at our request agreed to mill for us 40 bags of each of the following varieties of wheat:—Federation, Marshall's No. 3, Comeback, and Tarragon. The objects of the test were—(1) to obtain samples of flour of these four varieties of wheat from a mill running on commercial lines; (2) to obtain samples of flour of the same four varieties from the miniature mill of the department; (3) to obtain samples of flour of the same four varieties from a similar experimental mill in the Department of Agriculture, New South Wales.

All these flour samples were duly collected for examination and testing, the latter samples being obtained through the courtesy of the Government Agricultural Chemist, Sydney (Mr. F. B. Guthrie), and his milling assistant

(Mr. G. W. Norris). The samples of flour from each of these three millings were then tested and reported on by the Agricultural Chemist to the Department of Agriculture (Mr. W. A. Hargreaves) and by Mr. Guthrie, and a comparison of their figures affords an interesting study. The scope of the tests was further extended by conducting a baking experiment on each of the flours. We are indebted to Messrs. Eldridge, Kinnaird, Condell, and Collins for placing their expert knowledge and their bakeries at the disposal of the department.

The general results of these tests justify the following conclusions:—
 (1) That the most satisfactory results can be obtained, so far as wheat-testing is concerned, from the small experimental mill of the department; (2) that the strength of our wheats is quite as high as those of the same varieties in New South Wales; (3) the present method of testing wheats is most unsatisfactory.

RESULTS FROM LARGE MILL.

One hundred and twenty bushels of each of the following varieties of wheat—namely, Federation, Marshall's No. 3, Comeback, and Tarragon—were separately milled by Messrs. Thomas & Co., of Port Adelaide. A special effort was made in each of these millings to obtain a truly typical sample of each variety for physical and chemical tests. A small sample of each variety was forwarded to Mr. W. A. Hargreaves, and a duplicate sample of each forwarded to Mr. F. B. Guthrie. Mr. Hargreave's report is summarised in Table I.

Table I.

Name of Flour.	Color.	Strength.	Nitrogen. Per Cent.	Gluten. (N x 5·76)	Consistency of Dough.
1. Federation ..	Very good, yellow tinge	41·5	1·33	7·66	Fairly firm, not elastic, fairly extensible
2. Marshall's No. 3	Excellent	45·0	1·34	7·7	Fairly soft and elastic, extensible
3. Comeback	Good	48·0	1·60	9·2	Firm, slightly elastic, rather short
4. Tarragon	Very good, yellow tinge	41·5	1·85	10·6	Fairly soft, non-elastic, fairly extensible

Mr. Guthrie's report was as follows:—

Table II.

Name of Flour.	Color.	Strength.	Dry Gluten.	Nature of Gluten.
1. Federation	Excellent	48·5	12·47	Yellow, non-coherent, slightly elastic
2. Marshall's No. 3	Excellent	48·8	8·44	Slightly yellow, coherent, elastic
3. Comeback	Good, pink tinge	55·6	11·0	Deep yellow, elastic, tough, fairly coherent
4. Tarragon	Excellent	48·0	12·08	Slightly yellow, coherent, elastic

It will be noted that while the figures given for strength show a wide absolute variation, they show a similar relative variation.

It must be remembered that the strength is measured by the number of quarts of water absorbed by a 200-lb. sack of flour to make a dough of definite consistency; i.e., a consistency fit for baking. Of course, in such an estimation the personality of the operator is bound to find expression, for it is very questionable whether two operators will absolutely agree as to the best consistency of a dough for baking purposes. To further illustrate this point the results of two analyses of duplicate samples of flour milled by our own mill may be taken.

Table III.

Name of Flour.	(Mr. Hargreaves.)	Strength. (Mr. Guthrie.)
1. Federation	43	51·4
2. Marshall's No. 3	42	51
3. Comeback	48·5	59·5
4. Tarragon	40·2	49·2

Here again the absolute figures vary considerably though the relative variation agrees very closely.

It would seem as though the only way to decide on the actual strength would be to actually bake the dough made in each estimation, and judge by the quality of the loaf as to whether too much or too little water had been used in the estimation of strength. That the baker can throw little light on the question of strength will be apparent from the following facts:—Fifty pounds of each of the four samples of Thomas & Co.'s flour were submitted to Messrs. Condell & Collins, Eldridge, and Kinnaird, and these bakers were asked to carefully record the amount of water required to make a dough of a consistency fit for baking. The results are given in Table IV.

Table IV.

Name of Flour.	Water Absorption.						
	1. Condell & Collins.		2. Eldridge.		3. Kinnaird.		
	lbs.	ozs.	lbs.	ozs.	lbs.		
1. Federation	31	10	....	32	0	....	33 $\frac{3}{4}$
2. Marshall's	30	8	....	32	0	....	35
3. Comeback	31	4	....	30 $\frac{1}{4}$	0	....	33 $\frac{1}{4}$
4. Tarragon	33 $\frac{1}{2}$	0	....	31	6	....	36

It will be seen, therefore, that the estimation of the strength is a difficult problem, and that if strength is measured by the water absorption capacity of the flour the personal equation is necessarily introduced, and absolutely similar results can hardly be expected. From the results of frequent baking tests conducted by the department we are, however, satisfied that the estimation of the strength in the laboratory by the burette is generally more satisfactory than the estimation of the strength in the bakery. In the laboratory

disturbing factors are practically eliminated, whereas in the bakery temperature of working, mode of working, quality of the yeast, &c., greatly influence the results.

BAKING TESTS OF FLOUR FROM LARGE MILL.

Each of the four samples of flour was submitted to a careful baking test in order to discover the water absorption capacity of the flours, the behavior of each flour in working, and the quality and texture of the loaf.

The following table summarises the results :—

Table V.—Baking Tests.

Baker.	Flour Used.	Water Used.	Bread Made.		Moisture in Bread 26 hours after Baking.	Volume of Bread per lb.	Bakers' Notes on Flour.
			2 hrs. after baking	4 hrs. after baking			
1. FEDERATION.							
Condell & Collins	50	31 10	70 $\frac{3}{4}$	69 $\frac{3}{4}$	44.39	1433	Good working flour, firm dough, firm loaf of fair color and texture.
Eldridge	50	32 0	73 $\frac{1}{2}$	71 $\frac{1}{2}$	45.06	1328	Good working flour, fair strength, good color; texture not up to average.
Kinnaird	50	34 12	77	—	43.85	1365	Very short, easily worked, fair loaf of fair color and texture.
2. COMEBACK.							
Condell & Collins	50	31 4	71 $\frac{3}{4}$	71 $\frac{3}{16}$	44.4	1353	Very strong flour, tightened up in working, size increased in dough, close texture, pile good.
Eldridge	50	30 4	72	71 $\frac{1}{4}$	43.69	1230	Good working flour, easier mixed than No. 1, bread small, had the appearance of being "bound."
Kinnaird	50	33 4	76	—	45.2	1517	Very strong elastic dough, which tightened up after working, good blending flour.
3. MARSHALL'S. No. 3.							
Condell & Collins	50	30 8	72	71 $\frac{5}{16}$	45.8	1395	Soft flour, color fair, worked ragged, and lost bulk in dough, loaf small.
Eldridge	50	32 0	76	74	45.66	1283	Poor sample to use as a straight flour, having feeling of pudding rather than dough.
Kinnaird	50	35 0	77 $\frac{1}{2}$	—	44.96	1337	Good dough, loaf poorest of all, color lead, crust ragged, texture coarse.
4. TARRAGON.							
Condell	50	33 8	74	71 $\frac{1}{16}$	46.29	1523	Good all-round flour, kept bulk well, good loaf, texture, color, and pile good.
Eldridge	50	31 6	72	70 $\frac{1}{2}$	44.9	1523	A "ringer," fine sample, of good strength, bread fair color, good texture.
Kinnaird	50	36 0	78 $\frac{1}{4}$	—	46.9	1582	Worked well, good loaf, fair strength and color, good bloom on crust.

The following general remarks were submitted by the bakers:—

Condell & Collins.—Tarragon the best all-round flour; Federation and Comeback good working flours, the former being good in color and the latter exceptionally strong; Marshall's No. 3 soft and flabby in dough, not suited for baking by itself.

Eldridge—Tarragon "the ringer," bread from this best of all, having fair color, good texture, fine, bulky loaf.

Kinnaird—Federation and Tarragon the best commercial flours; Comeback decidedly the strongest, but only good for blending; Marshall's No. 3 needs color and strength.

RESULT FROM SMALL EXPERIMENTAL MILL.

The four samples of grain submitted to Thomas & Co. were milled in the small experimental mill of the department, and the resultant flours were examined by the Government Analyst. The results are given in Table V.

Table V.

	Milling Products.		Color.	Strength.	Nitrogen.	Gluten.	Consistency of Dough.
	Flour.	Offal.					
1. Federation	72·6	27·4	V. Good	43	1·54	N x 5·76 8·9	Soft, slightly elastic, fairly short
2. Marshall's No. 3	70·2	29·8	V. Good	42	1·27	7·8	Fairly soft, not elastic, very extensible
3. Comeback	69·3	30·7	Good	48·5	1·66	9·56	Fairly firm, elastic, short
4. Tarragon	72·6	27·4	Good	41·2	1·9	10·94	Fairly soft, not elastic, very extensible

A comparison of these results with those obtained by Mr. Hargreaves from similar flours of Messrs. Thomas & Co. shows that the strengths and the relative gluten and nitrogen contents of the flours from the small mill closely approximate the corresponding figures given for the flours from the large mill.

A duplicate of each of these flours was sent to Mr. Guthrie for examination, and his report is given as Table VI.

Table VI.

Name of Flour.	Color.	Strength.	Gluten.	Physical Condition of Gluten.	
				Per cent.	
1. Federation	Very good	51·4	9·29	Yellow, elastic, coherent	
2. Marshall's No. 3 ..	Good	51·0	8·9	Yellow, soft, coherent, slightly elastic	
3. Comeback	Very good	59·5	10·71	Dark, yellow, tough, non-coherent	
4. Tarragon	Very good	49·2	12·2	Yellow, elastic, fairly coherent	

It will again be noted that these results correspond relatively to similar results obtained by Mr. Guthrie on the corresponding flours produced from Thomas & Co.'s mill. Moreover, it is apparent that there has been no diminution of strength in the flour from the small mill; indeed, it would appear that the small mill tends to give flour of slightly higher strength than that produced from a commercial mill.



DEPARTMENT'S EXPERIMENTAL WHEAT-TESTING MILL.

The four samples of the wheat used in these milling tests were forwarded to Mr. Guthrie with a request that he should mill them in the New South Wales Government experimental mill and examine the flours obtained. His report is summarised in Table VII.

Table VII.

	Mill Products.		Strength.	Color.	Gluten.	Nature of Gluten.	Milling Notes.
	Flour.	Offal.					
Federation	71·1	28·9	48·5	Ex.	8·86	Yellow, non-coherent, slightly elastic	Bran clean, pollard clean; sem., yellow and soft
Comeback	74·6	25·4	57·5	Ex.	10·49	Deep yellow, elastic, tough	Bran clean, small; pollard clean; sem., yellow and gritty
M. No. 3..	71·1	26·9	45·6	Good	7·39	Faint yellow, coherent, elastic	Bran clean, large; pollard clean; sem., faint yellow and soft
Tarragon..	71·2	28·8	47·0	Ex.	11·10	Faint yellow, coherent, soft	Bran clean, pollard clean; sem., slight yellow and soft.

A further test was made on the four samples of flour milled by the small mill. We were able to bake 50-lb. lots of each sample in the large baking test with Messrs. Thomas & Co.'s flours. The miniature departmental mill, however, can produce only small quantities of flour, and special care had therefore to be exercised in baking to provide against any possible sources of error. Exactly 2lbs. of flour of each variety was submitted to Mr. Eldridge, an expert baker, to conduct a baking test. In order to ensure accuracy in measuring the water absorption capacity, Mr. Eldridge added the "mixed liquor," i.e., yeast, salt, and water, from a tall narrow burette graduated in cubic centimetres. The loaves were weighed two and four hours after baking and 26 hours after taking them from the oven they were tested for moisture and volume per pound. Table VIII. gives the results of this test.

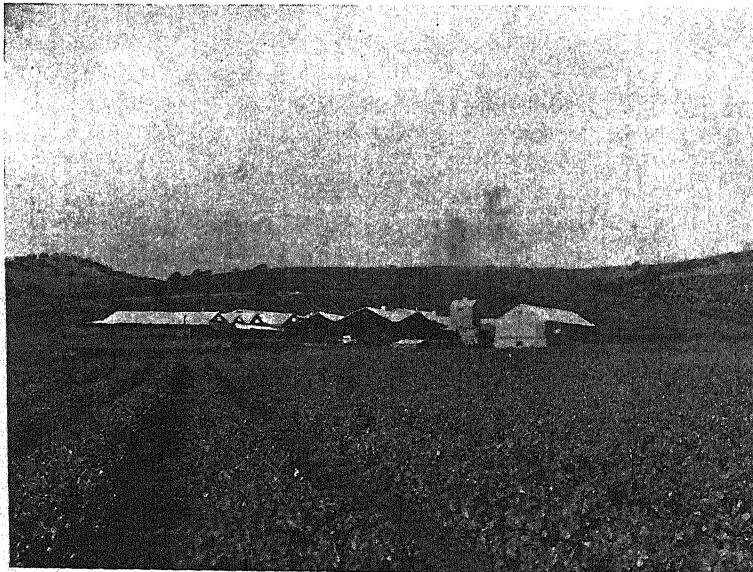
Table VIII.

Variety.	Weight of Flour.	Mixed Liquor Added.	Estimated Strength.	Weight of Bread After Baking.		Per Cent. $\frac{H_2O}{6}$	Volume of Loaf.	Volume per lb.
				2 hrs.	4 hrs.			
1. Federation	2	556	48·6	2·15 $\frac{1}{2}$	2·15	43·47	c.m. 3340	c.m. 1171
2. Marshall's No. 3..	2	552	48·5	2·15	2·14 $\frac{1}{2}$	43·72	3120	1096
3. Comeback	2	680	59·7	3·2 $\frac{1}{2}$	3·2	46·5	3320	1085
4. Tarragon	2	582	50·7	2·14 $\frac{1}{2}$	2·14 $\frac{1}{2}$	44·64	3820	1360

From these figures it will be noted that the water absorption power of the Comeback flour is exceptionally high, and agrees closely with the figures

given in Table VI. for the estimated strength in the laboratory. A correspondingly heavy bread yield will be noted with this Comeback flour. The figures given in the last two columns give a very fair indication of the texture of the loaf—a very important consideration in the estimation of quality. The loaf with the greatest volume was Tarragon, and its volume per pound was considerably higher than that of the other flours experimented with. This quite agrees with the result in Table IV., where Tarragon gave a larger loaf per unit weight than any of the other flours.

We cannot close without expressing thanks to Messrs. Thomas & Co., of Port Adelaide, for their kindness in milling the various samples ; to Messrs Condell & Collins, Eldridge, and Kinnaird for help received in carrying out the baking tests ; and to Messrs. Hargreaves and Guthrie for examining various samples of flour submitted to them.



VINEYARD AND WINE-CELLARS.

BUNT TESTS, 1909.

By A. E. V. RICHARDSON, B.A., B.Sc.

A set of experiments was recently conducted at the Parafield Experimental Farm with the object of testing the efficiency of various fungicides used in pickling wheat for the prevention of bunt, or what is sometimes called stinking smut.

Bluestone has been most generally used in this State for pickling purposes, and the results obtained this season indicate that this fungicide when properly used is quite efficient. The very fact that complaints have been made from time to time would seem to suggest that bluestone has not been entirely satisfactory in its action.

To understand why any particular mode of treatment can be effectual it is necessary to realise that bunt is caused by a fungus which reproduces itself by small bodies called spores, analogous to seeds in higher plants. This smut fungus is parasitic in its growth, and attacks the wheat plant just when germination takes place. The fungus then penetrates the wheat plant, lives on its host, grows with it, and ultimately produces myriads of spores which collectively form the "bunt balls" of infected heads. The effect of the fungicides in pickling is to kill all the spores in any way adhering to the grain. Of course, reinfection may and often does take place. This commonly occurs where pickled seed has been transferred to smutty bags which have not been treated with the pickling solution. Again, in sowing the seed bunt balls left among the grain by careless pickling may be broken in the drill and the contents of the ball scattered over the seed being sown. It is practically certain, however, that the ordinary methods of treatment are largely satisfactory, provided that care be taken to prevent further contamination.

In the Parafield tests two varieties of wheat were used—Federation and Comeback—and a complete set of experiments was carried out on each. Several pounds of carefully selected and graded seed of each variety were thoroughly infected by breaking a large number of bunt balls over the wheat and rubbing the grains with liberated spores until the whole mass was quite dark in color. One hundred grains were used in each plot, and were sown in two rows half a chain in length, 50 plants in each row.

The first plot was sown with wheat that had not been pickled, and therefore served as a standard of comparison for the remaining plots. The following

strengths of bluestone were used :— $\frac{1}{2}$ per cent., 1 per cent., $1\frac{1}{2}$ per cent., 2 per cent., $2\frac{1}{2}$ per cent., 3 per cent.; and in each case 100 grains of smutted seed were immersed in the pickle for exactly five minutes.

Formalin (which is a name given to a solution of formaldehyd gas in water) was used in three different strengths—1 in 480, i.e., 1lb. formalin to 48galls. of water, 1 in 400, 1 in 320. Fourteen per cent. and 20 per cent. solutions of sulphate of iron were also used, and in addition two special preparations—fungusine and Hackett's economic smut dressing.

The growth of each plot was carefully observed to note the effect of the various preparations on the germination, growth, and yield; and at harvest time each plant was carefully examined for bunt. All plots were sown on June 15th, 1909, three hours after pickling. The following table summarises the results :—

Table I.—Tests with Comeback.

Plot.	Treatment.	Germination.				Bunted.	Clean.	Per Cent. Clean.
		July 3.	July 11.	July 22.	Aug. 4.			
1	Untreated	89	92	95	94	46	48	51·1
2	Bluestone, $\frac{1}{2}\%$	63	77	87	90	6	84	93·4
3	Bluestone, 1 $\frac{1}{2}\%$	39	60	73	82	0	82	100
4	Bluestone, $1\frac{1}{2}\%$	29	48	61	80	0	80	100
5	Bluestone, 2 $\frac{1}{2}\%$	14	28	50	66	1	65	98·5
6	Bluestone, 2 $\frac{1}{2}\%$	14	29	51	76	0	76	100
7	Bluestone, 3 $\frac{1}{2}\%$	13	19	39	57	0	57	100
8	Formalin, 1 in 480	84	89	89	89	0	89	100
9	Formalin, 1 in 400	71	74	77	76	0	76	100
10	Formalin, 1 in 320	69	78	80	81	0	81	100
11	Ferrous sulphate, 14 $\frac{1}{2}\%$	59	72	77	76	17	59	77·7
12	Ferrous sulphate, 20 $\frac{1}{2}\%$	67	79	85	88	17	71	80·7
13	Hackett's	13	20	43	72	0	72	100
14	Fungusine	86	92	95	97	0	97	100
15	Formalin, $\frac{1}{2}\%$ + super...	57	79	90	94	0	94	100

1. A glance at the foregoing table will show that bluestone, especially the stronger solutions, considerably interferes with the germination, for, whilst in the untreated plot 94 per cent. of the seeds reached maturity, the number of mature plants fell in the bluestone plots to as low as 57 per cent.

2. Further, it is obvious that the bluestone solutions considerably delay the germination, the average number of plants per plot that had germinated in the bluestone series on July 3rd being 29 per cent., as against 89 per cent. in the untreated plot.

3. The formalin does not appear to have had such a deleterious effect on the germination and growth as the bluestone, and the same remark applies to fungusine. Plot 15, in which the seed was immersed in super. after being pickled with formalin, was somewhat tardy in germinating, but so far as subsequent growth is concerned it ultimately equalled that of the untreated plot.

4. With regard to the prevalence of smut it will be noted that whilst the disease was present in two of the bluestone plots, it was entirely absent in the formalin and fungusine plots, and also from the plot treated with Hackett's preparation. In view of the extreme severity of the tests it is gratifying to note that these latter pickling preparations were quite free from the disease. Ferrous sulphate was quite valueless, and the amount of bunt present was so great as to render the grain quite unfit for marketing.

A similar set of tests was carried out on Federation wheat, with essentially the same results. Table II. gives a summary of the results obtained with Federation :—

Table II.—*Tests with Federation.*

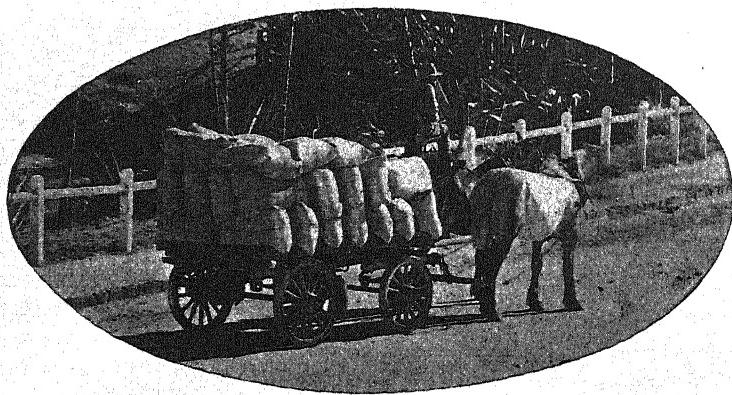
Plot.	Treatment.	Germination.				Bunted.	Per Cent. Clean.	Per Cent. Bunted.	Weight of Wheat.				
		July 3.	July 11.	July 22.									
				Aug. 4.	Bunted.								
1	Untreated	83	90	92	92	57	38·1	61·9	7 3				
2	Bluestone, $\frac{1}{2}\%$	79	90	95	96	2	97·9	2·1	7 3				
3	Bluestone, $1\frac{1}{2}\%$	66	85	93	97	2	98	2·0	7 10				
4	Bluestone, $1\frac{1}{2}\frac{1}{2}\%$	28	46	58	84	0	100	0	6 14				
5	Bluestone, $2\frac{1}{2}\%$	40	59	72	89	—	100	0	6 1				
6	Bluestone, $2\frac{1}{2}\frac{1}{2}\%$	35	52	79	89	—	100	0	5 10				
7	Bluestone, $3\frac{1}{2}\%$	30	49	70	84	—	100	0	5 7				
8	Formalin, 1 in 480	78	93	95	95	—	100	0	6 14				
9	Formalin, 1 in 400	85	95	95	96	—	100	0	6 13				
10	Formalin, 1 in 3-0	77	90	91	93	—	100	0	6 13				
11	Ferrous sulphate, 14 %	52	61	70	72	11	84·7	15·3	6 14				
12	Ferrous sulphate, 20 %	68	80	83	86	19	77·9	22·1	6 10				
13	Hackett's	39	54	74	89	—	100	0	6 13				
14	Fungusine	83	92	92	93	—	100	0	8 4				

In this last test the produce from each plot was carefully gathered and weighed, and the results proved very interesting. The plots were situated on a remarkably even stretch of soil, and every endeavor was made to give each plot as far as possible absolutely similar conditions for development. A perusal of the results will show that the observations made with regard to the Comeback plots apply with equal force to the Federation plots. The stronger solutions of bluestone were quite efficient fungicides, but they considerably delayed the germination. The same may be said of Hackett's smut dressing. On the other hand, formalin and fungusine were entirely satisfactory, the latter especially so, having little material effect on the germination, and at the same time they proved to be perfectly free from bunt.

The plot treated with fungusine was remarkably uniform, and was at all stages of growth as good as if not better than the untreated plot. It will be noted that the produce gathered from the bluestone plots decreased in quantity as the strength of the application increased, and this was quite in

harmony with the growth and appearance of the plot. The formalin plots and Hackett's preparation gave a yield equal to that of the efficient bluestone plots, whilst the yield from the fungusine plot stood prominently in advance of all the others.

Generalisations on the results of a single season's work are doubtless risky, but the results from the use of fungusine appear so satisfactory as to at least warrant bringing it before the notice of agriculturists. A further test will be conducted next season with this preparation. The cost of pickling the seed with this preparation is moderate. A box of the preparation containing 33½ lbs. net (cost price 10s.) suffices for the pickling of 100 bush. of wheat at a cost of 1½ d. per bushel. Two pounds of the preparation is mixed with 2 gallons. of water, and the mixture poured over 6 bush. of seed. The mass is turned a few times, allowed to dry, and is sown as soon as possible. It might be mentioned that formalin can be purchased in 1-lb. bottles at about 1s. 6d. per pound, which is sufficient for the preparation of 40 gallons. to 50 gallons. of pickle.



ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, December 8th, the following members being present :—Messrs. J. W. Sandford (chair), J. Miller, G. R. Laffer, C. J. Valentine, R. J. Needham, Col. Rowell, and Professors Perkins and Angus.

A letter was received from the Port Elliot Branch, requesting the Board to consider the question of selling cattle by live weight—in accordance with a paper read at a meeting of the Branch in August. It was pointed out that owing to their long experience and practice butchers were able generally to judge the weight of a live beast more accurately than the farmers. In other parts of the world the beasts were driven upon large scales and sold according to the weight indicated on a dial. After discussion it was decided to forward the communication to the Metropolitan Stock Salesmen, the Master Butchers, and the Abattoirs Board, with a request that they should express an opinion on the subject.

The Yongala Vale Branch wrote that the value of the annual visit paid by the farmers to the Roseworthy Agricultural College would be considerably increased if arrangements could be made for a competent man to accompany each party of about 50, and explain the character and purpose of the various things inspected. If that were done there would be less hurry, and the visitors would gain much more useful information. Professor Perkins said it was always open for parties of 50 or fewer to visit the College, and to be conducted over the property, by arrangement. On the occasion of the annual visit he put as many men as were available in the wagons which bore the visitors ; but, of course, there were not sufficient men for one to be placed in each vehicle. He would suggest that visits should be paid by the farmers in smaller batches, at other times, when it would be possible to devote more attention to them.

A letter from the Comptroller-General of Customs, Melbourne, stated that complaints had been made to the department that the new standard sacks were much inferior in quality to the old bags. An expression of opinion was desired as to whether the raising of the prescribed weight of the sacks by 2ozs., which would make them 2lbs. 6ozs., instead of 2 $\frac{1}{4}$ lbs., would be advisable. The question of the possibility of the farmers and others being prejudicially affected by the introduction and sale of second-hand standard sacks had to be considered, and the Minister of Customs desired an opinion relative to the desirableness of it being made a condition precedent to delivery

from the control of the Customs that all second-hand sacks imported be indelibly and legibly branded "second-hand." Professor Perkins said his experience last year was that the new sacks were much inferior to the old. Again and again when dropped full of grain they split. Sacks that had been in use for a couple of months could not be used again. Professor Angus said he could bear out what Professor Perkins had said. The greatest weakness of the Chapman bags was down the sides, where they were sewn. Frequently he had discovered grain running through the seams. The Chairman did not think it would be advisable to brand second-hand sacks to that effect, because it might be inferred that the contents of the bags were second-hand. Mr. G. R. Laffer considered that the importation of second-hand sacks rendered it possible for the introduction of all sorts of diseases. The acting secretary pointed out that the bags were quarantined for some time before being permitted to go into circulation. On the motion of Professor Perkins, seconded by Professor Angus, it was resolved—"That we confirm the impression of the farmers generally, that the new sacks are much inferior to the larger bags, and that anything which may tend to strengthen them should be done." In regard to second-hand standard sacks, it was decided to suggest that their importation should be prohibited.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. J. Lawry, E. Trezise, and C. Bray, Moonta; F. C. Ballard and A. F. Langdon, Keith; H. K. Giles and H. D. Young, Kanmantoo; H. Traeger, Balaklava; A. Hogan, Davenport; R. Barry, Maitland; W. Kuhne, Kybybolite; L. Giles, Clarendon; G. J. Dix, Renmark; L. Fisher, Tatiara; G. Serle, Millicent; Captain Woodcock, Lyndoch; J. J. Guerin, Kalangadoo; S. Eastwood and N. S. Kelly, Northfield; J. Scales and A. Lee, Clare.



WOODS AND FORESTS DEPARTMENT.

The Annual Report.

In his report for the year ended June 30th, 1909, the Conservator of Forests (Mr. Walter Gill) gives the following statement respecting the trees planted on the forest reserves under his charge:—

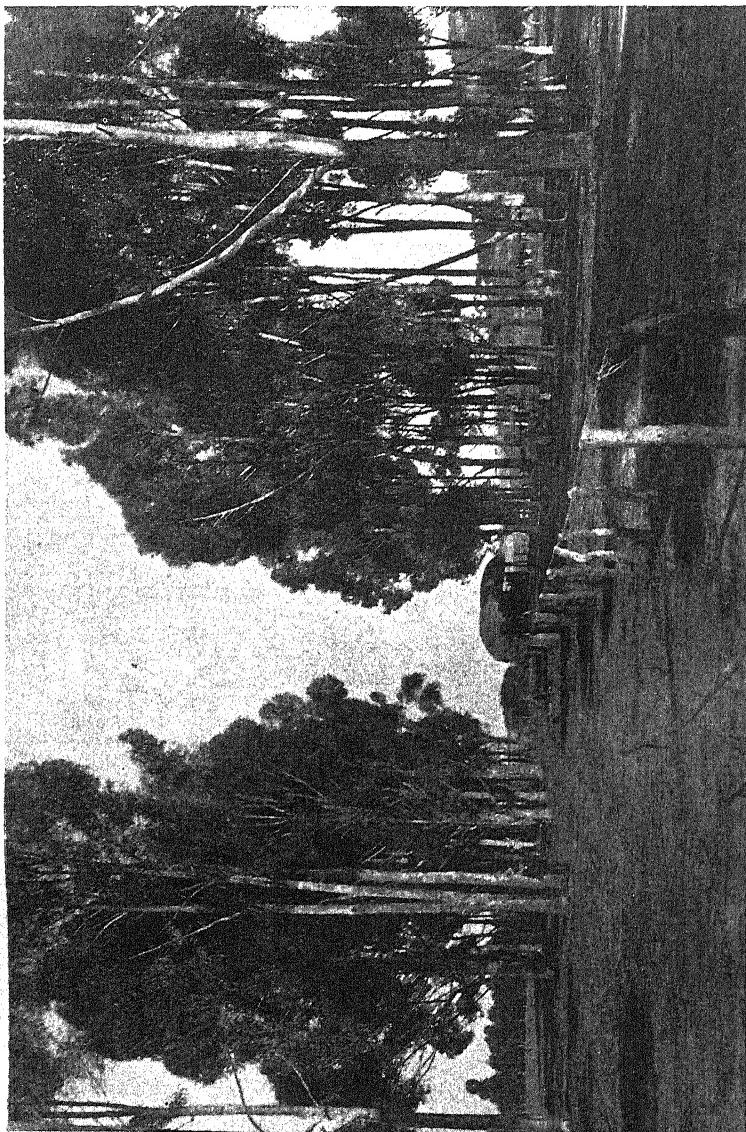
Name of Reserve.	Number Originally Planted.	Number Dead.	Number Alive.	Percentage Alive.
Bundaleer	8,545	1,475	7,970	82 $\frac{1}{2}$
Hanson	32,450	8,360	24,090	74
Kuitpo	14,772	805	13,967	94 $\frac{1}{2}$
Mount Burr	19,000	238	18,762	98 $\frac{1}{2}$
Parilla	2,950	224	2,726	92 $\frac{1}{2}$
Penola	12,600	63	12,537	99 $\frac{1}{2}$
Redhill	11,471	2,465	9,006	78 $\frac{1}{2}$
Wanilla	4,830	858	3,972	82
Wirrabara	9,470	285	9,185	96 $\frac{1}{2}$
	116,088	14,773	101,315	87 $\frac{1}{2}$

"The new reserve at Parilla, in the Pinnaroo district, gives the best return for gums and sheoak, 92 $\frac{1}{2}$ per cent. being alive in the plantation started there. As the planting at Parilla was carried out on purpose to test the suitability of the locality for forest operations, special efforts were made to give the trees every chance on the area planted—about five acres. The returns obtained are very satisfactory, for in addition to the good percentage secured, the average growth is also encouraging, many of the sugars being 3ft. and 4ft. high, and numbers of the swamp oaks being 4ft. and 5ft. high in 10 months' time. During the year thinning and pruning operations have been carried out on Bundaleer, Cave Range, and Wirrabara forest reserves, and the total area planted is 192 acres.

"A steady demand continues for the cases manufactured at the mill at Wirrabara Forest, with satisfactory results to the revenue. The local requirements amounted to 5,050 cases, a few of which were used for butter, but the main bulk for exporting apples. Another contract was successfully carried out for supplying the Renmark Fruit Packing Union with 11,000 28-lb. raisin boxes, and 10,000 56-lb. raisin boxes, receipt of which was acknowledged by a letter from their agents, Messrs. P. Wood, Son, & Co., conveying on their behalf their appreciation of the highly satisfactory manner in which the work was carried out, and expressing the desire that business relations might be maintained over many years.

"ARTIFICIAL TREATMENT OF TIMBER."

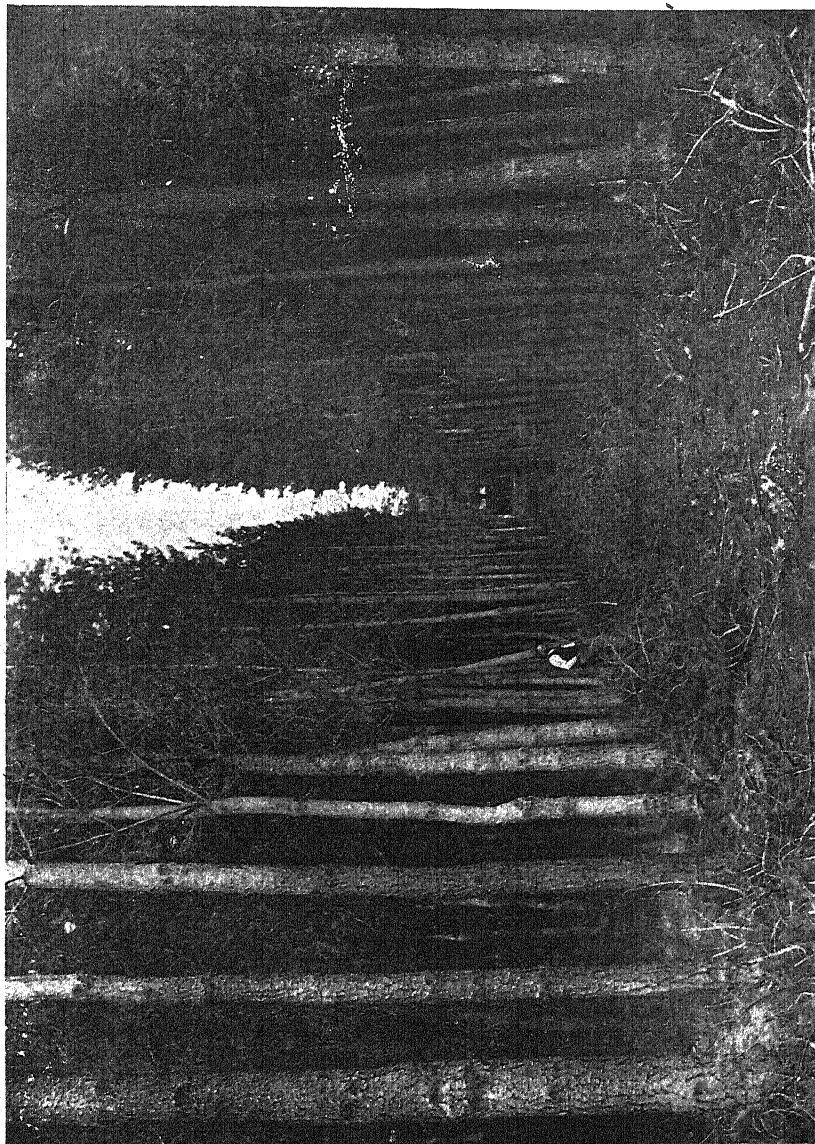
"The constant demand for timber in all the States is rapidly decimating the forest resources on this continent. Usually only one-third of the timber



*W. Gill, Photo.]
Sugar Gums supplied by Forest Department and grown by Mr. H. Burford, Spring Farm, Yacka, in 20 Years.*

on any given area is properly utilised; two-thirds are generally destroyed by axe and fire, owing to the unsystematic and wasteful character of lumbering operations. Where timber is felled for clearing it is *all* destroyed in the most

rapid and effective way possible. The mature timber will soon be exhausted, and when once that is gone there will be no dodging the consequence. The



Remarkable Pines at Wimberley, 24 years old.

W. Gill, Photo.]

question how soon can *young* timber be used *must be faced*. Another question almost as important is to what extent can we make timbers now considered worthless fit for use by artificial treatment?

"A great deal has been done in America and on the Continent of Europe in this way by some of the most eminent engineers of the day to make otherwise useless timber capable of utilisation; and, being greatly impressed with the importance of taking some definite action, I drew the attention of the Government three years ago to the desirability of carrying out some experiments in the direction indicated. I believe a limited amount of work has been done in the interim, but only in connection with timber for sleeper purposes. This, however, is but one aspect of the question, touching but the fringe of it. Every industry in which timber is used may be greatly benefited by carrying out a series of experiments with some of the preservatives available, and a few hundreds expended in this way cannot fail, whatever the result, to lead to the acquisition of much valuable information. This is not the place in which to amplify the many aspects of the question, which offer most interesting data for discussion; but I feel it my duty, in the face of the astonishing rapidity with which timber is everywhere disappearing, to sound a warning note as to the imperative necessity for finding an answer to the question—What shall we do when all our mature timber is gone?"

Mr. Gill adds to the interest of his report each year with a number of excellent illustrations, two of them, which show the best results in the planting of pines and sugar gums, are reproduced.

DISTRIBUTION OF TREES.

"During the year ended June 30th, 1909, 1,680 persons applied for and received 277,616 trees. The following numbers were issued from the various nurseries:—

Nursery.	Trees Issued.	Recipients.
Belair	53,400	436
Bundaleer	73,949	349
Kapunda	70,423	424
Mount Brown	2,971	34
Mount Gambier	39,972	230
Wanilla	11,113	72
Wirrabara	25,788	135
Total	277,616	1,680

"On June 30th, 1909, the stock of trees on hand, including those reserved for departmental use, was as under:—

Nursery.	Trees.
Belair	69,342
Bundaleer	150,250
Kapunda	38,100
Mount Brown	5,512
Mount Gambier	55,052
Wanilla	27,411
Wirrabara	67,580
Total	413,247

"The free distribution of trees has now been carried on for 27 years, and during that time 7,266,525 trees have been given away to 34,998 applicants.

GOVERNMENT PRODUCE DEPARTMENT.

The Annual Report.

The following extracts are taken from the report of the Government Produce Department for the year ended June 30th, 1909:—

The volume of business transacted by the department has again eclipsed that of any previous year, and no further evidence than this is required to demonstrate the usefulness and popularity of this department with the producers of the State. It is gratifying to note that inquiries are continually being received from other States and New Zealand for particulars of plant and general working arrangements, and methods of treating and disposal of various lines of produce dealt with. The Adelaide Metropolitan Abattoirs Board and the Geelong Harbor Trust representatives have made a personal inspection of the works prior to the erection of works of a similar character, and have been supplied with expert advice and information appertaining to them.

Value of Overseas Exports shipped through Department during Season, 1908-9.

	£. s. d.
Lamb—184,345 carcasses=6,213,776lbs., at 3½d. per pound	97,090 5 0
Hoggets—5,526 carcasses=219,615lbs., at 3d. per pound	2,745 3 9
Mutton—50,090 carcasses=2,289,046lbs., at 2½d. per pound	23,844 4 7
Beef—833 qrs.=140,617lbs., at 3d. per pound	1,757 14 3
Butter—18,205 boxes=155 tons 2cwtis. 2qrs., at 1s.	50,974 0 0
Wine—1,588 hhdls.=100,044galls. 722 pun. = 75,088galls... } 177,112galls., at 2s.	17,711 4 0
60 qr. casks=1,980galls... }	
Fruit—58,376 cases apples	
8,959 " pears	
308 " grapes	
151 " quinces	
5 " plums	
67,799 cases, at 10s. per case...	33,899 10 0
Poultry—248 ducklings at 3s. each	37 4 0
496 chickens at 10d. each.....	73 18 1
180 squabs = 268lbs. at 10d.	11 3 4
Honey—1,542½ cases=81 tons 4cwtis. at 2½d. per pound.....	1,894 13 4
Rabbits—507 crates=12,774 rabbits, at 6d. each.....	319 7 0
Eucalyptus oil—5 cases=30doz. 2oz. bottles, 5½d. bottle	8 12 6
	<hr/>
	£230,366 19 10

In a normal year the value of the lambs and mutton exported would have been some £29,870 more than during the past season, but the extraordinarily low prices prevailing in London at present have reduced the value of this export trade to approximately that extent.

RABBITS.

Five hundred and seven crates, containing 12,774, were all that were exported through the department during the season 1908-9.

BEEF.

The first shipment of frozen beef was forwarded to England, and consisted of 838 quarters, weighing 140,617lbs.

CANNERS AND POTTERS.

In connection with the erection of a canning plant at the depot, purchases were made of sheep to the number of 14,171. Many of these were only fit for boiling down, but some 8,391 are being canned, with a view of ascertaining whether there is a market for this class of goods.

BUTTER FACTORY.

The popularity of this branch of the department may be best judged by the increasing trade, which has been so great that it has been found necessary to erect a new factory with increased accommodation during the year under review. The department has now 1,213 suppliers, ranging from Mount Gambier and Beachport in the South-East to beyond Hawker in the North. In all 25,113 cans were received, containing 1,222,074lbs. of cream, which produced 669,344lbs. of butter, or, in other words, 294 tons 13cwt. 0qrs. 22lbs. The quality of the cream has been well maintained, and 1 $\frac{8}{10}$ lbs. of cream manufactured 1lb. of butter. In all 16,592 account sales were issued, the payment for which amounted approximately to £27,000. The average price paid to producers for their butter during the year was 11 $\frac{2}{3}$ d. per pound.

Table No. 1 below shows a comparison between this and the preceding year; table No. 2 giving the sales of Government factory butter by the Commercial Agent in London during the various months of the export season, with the approximate values of South Australian butter in England for the same period.

Table No. 1.

Year.	No. Suppliers.	No. of Cans.	Pounds of Cream.	Pounds of Butter Produced.	No. of Account Sales.	Payments for Butter.
1908 ..	775	21,736	949,176	499,961	13,480	£20,000
1909 ..	1,213	25,113	1,222,074	669,344	16,592	£27,000

Table No. 2.

Boat.	Left Ade aude, 1908-9.	Sold England, 1908-9.	Pure Creamery.			Cross Keys.		
			Boxes.	Highest.	Lowest.	Boxes	Highest.	Lowest.
				s.	s.		s.	s.
<i>Mongolia</i> ..	Sept.. 3	Oct... 22	100	114	—	—	—	—
<i>Ormuz</i> ..	" 10	" 20	60	118	—	—	—	—
<i>India</i> ..	" 17	" 20	72	120	—	—	—	—
<i>Orotava</i> ..	" 24	Nov... 11	80	118	—	—	—	—
<i>Victoria</i> ..	Oct... 1	" 27	92	116	112	—	—	—
<i>Orontes</i> ..	" 8	" 27	80	114	112	—	—	—
<i>Mooltan</i> ..	" 29	Dec.. 17	620	108	104	—	—	—
<i>Orient</i> ..	" 22	" 17	180	110	104	—	—	—
<i>Oroya</i> ..	Nov... 5	" 24	156	108	106	20	104	98
<i>China</i> ..	" 12	" 26	331	106	102	65	106	97
<i>Ortona</i> ..	" 19	" 27	190	105	104	20	104	102
<i>Moldavia</i> ..	" 26	Jan... 2	200	108	—	—	—	—
<i>Ophir</i> ..	Dec... 3	" 12	89	111	102	17	104	102
<i>Himalaya</i> ..	" 10	" 16	110	106	—	10	104	—
<i>Oruba</i> ..	" 17	" 24	150	108	106	10	102	—
<i>Ormuz</i> ..	Jan... 28	Mar... 3	80	103	—	—	—	—
<i>Morea</i> ..	Feb... 4	" 13	80	103	—	—	—	—
	Total		2,670 boxes.			142 boxes.		

Financial.—The year's operations show that a profit of £1,004 6s. 5d. has been made. Of this sum it is proposed to return to the producers (in the shape of a bonus) £500, the balance being carried forward to the reserve fund in this branch. The method of payment of the bonus will be to pay a percentage on the gross amounts of the cream-suppliers' account sales, and this system will give a greater return to the suppliers of the best quality cream, and should prove an incentive for efficient work in the various dairies.

LAMB AND MUTTON.

The season 1908-9 has again established a record in the number of carcasses exported oversea from the State. The total of lambs fell short of the 1907-8 season by 4,592 carcasses, but the increase in mutton to the extent of 63,132

carcasses, and hoggets to the number of 6,377 carcasses, has brought the year's total to 64,917 carcasses in excess of the greatest number shipped previously. The following table gives figures showing the number of carcasses exported from year to year since the inception of the department, and demonstrates the gradual increase in the business.

Total Carcasses Exported Since Inception of Department.

Year.	Lambs.		Total.	Hoggets.		Total.
	Depot.	Privately.		Depot.	Privately.	
1895-6	1,751	—	1,751	—	—	—
1896-7	10,606	—	10,606	—	—	—
1897-8	3,534	—	3,534	—	—	—
1898-9	38,620	—	38,620	—	—	—
1899-1900	89,980	—	89,980	—	—	—
1900-01	94,597	—	94,597	—	—	—
1901-2	45,410	47,134	92,574	—	—	—
1902-3	63,798	53,045	116,843	—	—	—
1903-4	64,930	91,436	156,366	—	—	—
1904-5	156,858	37,822	193,680	—	—	—
1905-6	163,819	87,750	251,569	—	—	—
1906-7	161,066	66,317	227,383	—	—	—
1907-8	194,687	72,942	271,629	—	—	—
1908-9	184,345	82,692	267,037	5,526	851	6,377
	1,277,031	539,138	1,816,169	5,526	851	6,377

Year.	Mutton.		Total.	Season's Total.
	Depot.	Privately.		
1895-6	1,097	—	1,097	2,848
1896-7	675	—	675	11,281
1897-8	463	—	463	3,997
1898-9	2,052	—	2,052	40,672
1899-1900	1,334	—	1,334	91,314
1900-01	7,122	—	7,122	101,719
1901-2	—	—	—	92,574
1902-3	19,464	18,656	38,120	154,963
1903-4	10,521	10,390	20,911	177,277
1904-5	2,254	311	2,565	196,245
1905-6	—	—	—	251,569
1906-7	2,613	434	3,047	230,430
1907-8	4,490	—	4,490	276,119
1908-9	50,090	17,532	67,622	341,036
	102,175	47,823	149,498	1,972,044

Quality.

Lambs.—The fact that the production of artificial fodders is rendered impracticable by the climatic conditions and sparsity of rainfall in many of the large lamb-raising centres of the State has made the securing of uniformity of quality a very difficult matter to overcome. Practically 75 per cent. of South Australia's production are milk lambs, and in consequence very quickly depreciate in quality as soon as the feed becomes dry. The opening of the season gave every indication of a highly satisfactory one, both as regards quality and price. In most districts a good percentage of lambs was dropped, and early feed was plentiful. For the reasons referred to above, as the season advanced a marked deterioration was shown, and the proportion of second and third grade lambs predominated.

Hoggets.—In previous seasons the export of hoggets or summer lambs has been limited, but a drop in the local values caused 6,377 carcasses, averaging 45.69, to be shipped. A difference of opinion as to the branding of this particular class of meat with the word "hogget" has existed, some exporters contending that the words "summer lambs" should be adopted. The latter title had previously been used, but there is always the danger of misrepresentation at the other end, and as London buyers are prone to look with suspicion on all heavy-weight lambs, it was decided that the word "hogget" was the true trade description.

Mutton.—Stockowners in the year just passed have been faced with the proposition of finding a market for surplus mutton, and the notable increase of last year's figures over all previous seasons in this class of meat is accounted for by that fact. The bulk of the shipments consisted of ewe mutton, and the quality showed great variation.

Tables are attached showing the average weight of lambs for the last eight seasons, and percentages of the grading, of both lamb and mutton, as well as the percentage in each class and the percentage of rejects as applied to the total number slaughtered.

Average Weight of Lambs.

Year.	Depot.	Privately.	Year.	Depot.	Privately.
	Lbs.	Lbs.		Lbs.	Lbs.
1901-2	33.13	—	1905-6	37.07	35.57
1902-3	32.03	—	1906-7	33.70	33.40
1903-4	34.97	—	1907-8	32.93	33.30
1904-5	35.22	—	1908-9	33.70	33.90

Grading Comparisons.

Year.	Depot.				Private.			
	First.	Second.	Third.	Rejects.	First.	Second.	Third.	Rejects.
LAMBS.								
1904-5 ..	135,868	21,657	—	1,796	—	—	—	—
1905-6 ..	114,426	45,850	—	2,359	51,287	12,108	2,229	609
1906-7 ..	94,255	67,603	1,961	4,491	20,484	46,871	19,210	2,387
1907-8 ..	95,827	97,533	5,327	9,684	34,619	33,719	4,646	1,948
1908-9 ..	74,798	82,274	27,273	7,702	23,925	44,380	14,387	2,929
MUTTON.								
1908-9 ..	15,035	19,845	15,210	1,923	4,988	8,864	3,680	732

Percentage of Rejections—Lambs.—1904-5—Depot, 1.12; 1905-6—Depot, 1.45; private, 0.90; 1906-7—Depot, 2.66; private, 2.68; 1907-8—Depot, 4.60; private, 2.30; 1908-9—Depot, 3.85; private, 3.42; *Mutton.*—1908-9—Depot, 3.68; private, 4.04. It cannot be stated that the grading is too severe; hence the number of carcasses rejected after slaughtering is regrettable. More care needs to be exercised in drafting out the lots previous to forwarding to the slaughterhouse. Without question, such lambs, if judiciously placed, would be far more profitable to the sheepgrower alive than the carcass when rejected after slaughter.

London Sales.—The earlier shipments which were sent to London to be disposed of by the Trades Commissioner realised prices which, although not so high as the previous seasons, were satisfactory, but the great slump in the frozen meat trade in London caused the late shipments to return very low prices. All exporters have had a bad year, the prices in London being the lowest ever known.

SALES BY COMMERCIAL AGENT.

Boat.	Left Adelaide.	Account Sales Received.	No. of Carcasses.	Average Weight.	Average Price per head, including Skin at Port Works. (Skin values approximate.)
	1908-9.	1909.			s. d.
Durham	Sept. 23 ..	Feb. 24 ..	433 lambs	34.74	10 10
Whakarua	Oct. 22 ..	March 8 ..	1,090 "	33.66	8 11
Cevic	" 26 ..	April 5 ..	340 "	38.39	9 0
Kent	" 31 ..	April 5 ..	491 "	34.20	7 9
Narrung	Nov. 2 ..	May 11 ..	1,148 "	37.97	9 9
I Langton Grange..	" 12 ..	June 23 ..	1,281 "	32.92	7 0
19 Ayrshire	" 12 ..	April 16 ..	399 "	34.23	7 6
19 Wilemannia	" 21 ..	May 14 ..	453 "	33.84	6 9
			434 sheep	40.95	5 6
1 Geelong	Dec. 5 ..	July 20 ..	1,437 lambs	30.56	5 6
			1,551 sheep	43.56	4 6
Suffolk	" 22 ..	July 8 ..	2,496 lambs	32.64	6 0
			1,191 sheep	43.56	4 6
Waratah	Jan. 20 ..	July 3 ..	119 lambs	30.62	5 3

BUTTER.

The exports of the State show a decrease when compared with those of the previous years. Earlier shipments met with firm London markets, but prices slackened as the season advanced, and were below those obtaining in 1907-8. All of the State's output was handled and shipped by the Government Depot, and of the 18,205 boxes exported during the year under review 2,812, or practically one-seventh of the total quantity, was manufactured at the Government Butter Factory. The following table gives the exports for the last three seasons :—1906-7—35,060 boxes—896 tons 10cwt. 0qrs.; 1907-8—24,536 boxes—613 tons 8cwt. 0qrs.; 1908-9—18,205 boxes—455 tons 2cwt. 2qrs.

WINE.

The shipment of wine to London under Government certificate for the 12 months amounted to 1,588 hogsheads, 722 puncheons, 60 quarter casks, containing in all 177,112galls.

RABBITS.

The trade in frozen rabbits is of very limited nature at the present, a position which, owing to poor demand and low prices, has prevailed for some few years. No rabbits were treated at the depot during the year, and only 507 crates were received for shipment. The balance exported from the State was sent direct to steamers by private works.

POULTRY.

The year's operations are set out in the table attached, which gives particulars of kinds of poultry shipped to London for sale by the Trades Commissioner, and the results obtained :—

Date.	Vessel.	Average Weight.	Kind.	Highest Price.	Lowest Price.	Average.	No. Birds.
		lbs.		s. d.	s. d.	s. d.	
Feb. 2, 1909 ..	<i>Commonwealth</i>	4	Ducks	4 10	2 9	3 7	130
		3 $\frac{1}{2}$	Chicks	4 7	1 9	2 8	49
Mar. 6, 1909 ..	<i>Wakool</i>	3 $\frac{1}{2}$	Ducks	2 10	2 9	2 9 $\frac{1}{2}$	94
		4	Chicks	6 0	2 0	3 2	225
April 24, 1909 ..	<i>Oswestry Grange</i>	1 $\frac{1}{2}$	Squabs	0 10 $\frac{1}{2}$	—	0 10 $\frac{1}{2}$	72
		4	Ducks	2 2	—	2 2	24
		3 $\frac{1}{2}$	Chicks	4 0	1 10	2 0	222
		1 $\frac{1}{2}$	Squabs	0 8 $\frac{1}{2}$	—	1 0, 8 $\frac{1}{2}$	108

The prices obtained were satisfactory, especially for the consignment of chickens, which were shipped per the s.s. *Wakool*, and it is anticipated that the experimental stages of this industry have now been successfully negotiated, and larger shipments have already been promised for the 1909-10 season.

WHEAT INSPECTION.

At the request of various merchants the officers of this department have inspected wheat at shipping ports throughout the State. Government certificates have been issued during the year for 169,041 bags, making the total 666,132 bags which have been shipped under Government supervision since the beginning of the inspection in February, 1906.

1906—February to June	94,517 bags
July to December	13,186 "
	<hr/>
	107,703 bags
1907—January to June	185,217 "
July to December	58,315 "
	<hr/>
	243,532 "
1908—January to June	145,856 "
July to December	81,119 "
	<hr/>
	226,975 "
1909—January to June	87,922 "
	<hr/>
	87,922 "
	<hr/>
	666,132 "

POULTRY MEAT MEAL.

As was anticipated, the department has experienced a continuous and increasing demand for their manufactured poultry meat meal. From January, when the initial lot was placed on the market, over 11½ tons, valued at about £230, were sold up to June 30th. Inquiries have been received from all Australian States asking for supplies, and it is the intention of this department to double the capacity of the plant at present in use.

EGGS.

All doubts regarding the possibility of landing eggs in London were dispelled by the results of the shipments made during the two previous years. The Trades Commissioner displayed great energy in proving to London buyers the keeping qualities of the infertile egg, and a permanent market was established at payable prices for as many eggs as the department could ship, provided shipments were regular and continuous from year to year. During the season under notice the local market for eggs did not recede to the usual low prices that have always prevailed at the glut of the season. Every effort was made to induce shippers to keep up the continuity of shipments. Many poultry-keepers saw the wisdom of having two strings to their bow, and forwarded eggs for shipment; but as a sufficient quantity could not be got together, the steamer space, which had been engaged, had to be filled with other produce. In all, between 60,000doz. and 70,000doz. eggs were received and stored at the depot during the year, and these were sold locally, to inter-State markets, and also in New Zealand.

HONEY.

The successful marketing in Great Britain of this class of produce is the outcome of the hard work and persistent advocacy of the Trades Commissioner. Large quantities were sold at the various exhibitions held in England, and by this means South Australian honey is becoming well known to

the consumer. The establishment of an oversea market for honey has very largely relieved the local market, and as a result local prices are now satisfactory to producers. During the year 1907-8 the department exported 1,712 tins, containing 101,318lbs. These figures have been considerably improved upon during the year under review, when 2,489 tins, containing 169,153lbs., were shipped.

THE FRUIT SEASON, 1909.

The quantity exported fell considerably below that of last year, as in almost every district the crop gathered was exceedingly light, whilst the ravages of codlin moth, added to the unusual amount of "bitter pit," in some localities contributed largely to the cause of the reduction in the export trade. The figures given below show the number of cases exported during the last six years from the State. It will be seen that there is a falling off of 82,016 cases, compared with last season, which, by the way, was a record one:—1904, 93,434 cases; 1905, 85,060 cases; 1906, 109,335 cases; 1907, 34,784 cases; 1908, 153,904 cases; 1909, 71,888 cases.

Shipments from South Australia and Destinations.

Shipments extended from January 26th to May 19th, and comprised 62,647 cases of apples, 8,733 cases of pears, 194 cases of quinces, and 314 cases of grapes. In all there were 33 separate shipments, 15 steamers loading at the Outer Harbor, 13 at the Ocean Steamers Wharf, Port Adelaide, and five at the Largs anchorage. The largest quantity, viz., 42,545 cases, was shipped over the Ocean Steamers Wharf. The *Orestes*, which sailed on March 5th, shipped at Port Adelaide 7,535 cases apples and 1,216 cases pears, this being the largest parcel of the season. Direct shipments were made to 15 different ports, although as usual the bulk of the fruit was sent to London and Hamburg.

The following table will show at a glance the quantity and variety of fruit sent to the various ports:—

Port.	Apples.	Pears.	Quinces.	Grapes.	Plums.	Total.
	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
London	30,001	7,452	71	74	5	37,603
Hamburg	19,710	1,171	103	85	—	21,069
Liverpool.....	3,196	50	—	—	—	3,246
Manchester	400	—	—	—	—	400
Bombay	3,342	10	—	—	—	3,352
Bremen	2,604	25	—	—	—	2,629
Genoa	848	—	—	—	—	848
Colombo	727	21	20	150	—	918
Marseilles	637	4	—	—	—	641
Batavia	450	—	—	—	—	450
Stockholm	412	—	—	—	—	412
Antwerp	165	—	—	—	—	165
Samarang	85	—	—	—	—	85
Sourabaya	50	—	—	—	—	50
Tjilatjap	20	—	—	—	—	20
	62,647	8,733	194	309	5	71,888

Compared with the oversea export trade of 1908, there is a marked decrease in the number of cases shipped. The undermentioned figures, which are approximately correct, show that there was a falling off in every State with the exception of Victoria, where, owing to an exceedingly prolific apple crop, the quantity exported more than doubled that of last year.

	1905.	1906.	1907.	1908.	1909.
Hobart	363,426	262,386	511,082	483,298	381,219
Adelaide	85,060	109,335	31,784	153,904	71,888
Melbourne	47,101	46,381	114,498	83,731	168,140
Sydney	—	—	6,819	2,355	146
Fremantle	—	—	275	1,321	667
	495,587	418,102	667,458	724,609	622,060

Quality.

Generally speaking, the quality of South Australian apples has been maintained, the chief source of anxiety being the prevalence of "bitter pit" in some districts. Apples which upon examination have every appearance of soundness frequently develop the "spot" during the voyage. This is most unfortunate for shippers, as such fruit has a depressing effect on the home market, depreciating values all round. Tasmania reports that the condition of their shipments was better than at any time since the Commerce Act came into operation.

The quality of pears shipped was all that could be desired, but this could not always be said of them on arrival at their destination.

Consignments to the Trades Commissioner for Sale.

Consequent on the decrease in the number of cases exported, it was not to be expected that last year's quantity (18,243 cases) would be equalled. Many of the smaller growers who usually take advantage of the facilities offered by the department did not consign. Taking this fact into consideration, the total, amounting to 10,514 cases, compares very favorably with previous consignments.

The varieties and ports to which shipments were sent were as under—

Port.	Apples.	Pears.	Quinces.	Grapes.	Plums	Total.
London	3,482	3,398	21	1	5	6,907
Hamburg	2,542	24	—	—	—	2,566
Marseilles	637	4	—	—	—	641
Manchester	400	—	—	—	—	400
	7,061	3,426	21	1	5	10,514

Varieties Shipped.

Growers for the most part confined their operations to the recognised export kinds, although small lots of numerous other varieties were shipped. In all there were 26 varieties of apple and 22 separate kinds of pears included in the shipments to the Trades Commissioner. The principal varieties being—

Apples.	Pears.
Cle patra	3,019
Dunn's Seedling	996
Jonathans	859
Rome Beauty.....	703
London Pippin	326
Nickajack	268
Stone Pippin.	181
Ren. du Canada	107
Five Crown	80
Rhymer	71
Glou Morceau	931
Vicar of Wingfield	552
Winter Nelis.....	447
Josephine	317
Buerre Boce	307
L' Inconnue	206
Keiffer's Hybrid	155
Dorondeau	139
Clairgeau	108
Bergamot	51

Co-operation of Growers.

This is a matter that has frequently been advocated by the Trades Commissioner, and it is pleasing to note that this season quite a large number of growers in the Angaston and Clare districts have conducted their business along these lines. There are several reasons why this course should prove advantageous :—(1) Saving of expense in various directions ; (2) reduction of the number of shipping marks ; (3) handling and shipping is facilitated ; (4) ensures a quicker delivery (often most important) at the port of discharge.

Fruit Sales.

With one or two exceptions the account sales for apples have been satisfactory to shippers, but the same cannot be said of pears, owing to the overripe condition in which the greater portion was landed. Below will be found an interesting table bearing on the gross prices received for apples, which clearly demonstrates the actual results. The charges to be deducted are approximately—London 1s. 1½d., Hamburg 1s. 4d., Manchester 9d., and Paris 3s. 9d. per case. Freight, which may be set down at from 2s. 10d. to 3s. per case, must also be deducted to arrive at the net proceeds at Port Adelaide,

Vessel.	No. Cases.	Left Adelaide, 1909.	Gross Price Realised per Case.		Averaged Gross Price Realised per Shipper.		Average Price per Shipment.
			Highest.	Lowest.	High st.	Lowest.	
APPLES SOLD IN LONDON, &c.							
Oroya	250	Feb. 25	s. d.	s. d.	s. d.	s. d.	s. d.
Orestes	420	March 3	13 0	9 6	12 3	9 6	12 0
" (Manchester)	400	" 3	12 6	9 0	12 2	10 10	11 9
Ortona	120	" 11	12 6	9 0	12 2	9 2	11 0
Moldavia	316	" 18	12 0	7 6	11 7	9 1	10 6
Sarpedon	636	" 24	12 6	6 0	11 7	9 1	10 6
Orontes	120	" 25	13 0	7 6	10 11	8 10	10 4
Tvlamon	739	" 31	12 0	—	11 1	8 10	9 8
Malwa	200	April 1	12 0	8 0	10 11	10 11	10 11
Asturias	275	" 8	11 6	8 0	10 11	10 11	10 11
Hector	306	" 15	12 0	9 6	11 11	9 7	9 10
Omrah	100	" 22	11 6	9 0	10 11	9 11	10 5
	3,882						
APPLES SOLD IN HAMBURG.							
Westfalen	507	Feb 24	13 9	4 11	10 2	5 4	7 3
Friedrich der Grosse	433	" 26	15 8	6 10	15 6	8 6	12 0
Oberhausen	895	Mrch 10	15 5	5 11	12 5	8 7	10 1
Bremen	350	" 26	13 9	6 11	12 7	8 10	11 1
Rostock	257	April 2	15 5	7 10	12 7	10 2	11 1
	2,542						
APPLES SOLD IN PARIS.							
China	381	March 4	22 2	0 5	15 11	7 0	11 1
Moldavia	256	" 18	16 8	2 5	13 7	8 2	10 2
	637						

It will be seen by the above table that the Hamburg market has been slightly better than that of London, although shippers to this port per the *Westfalen* were most unfortunate. This vessel met with a mishap on the voyage, necessitating a long stay at Port Said. A period of 14 weeks elapsed between time of shipment and the landing of the fruit. In ordinary circumstances the passage would have occupied only six weeks. As a result of this delay the boat (which was first to leave this year) was the last fruit steamer to arrive; consequently her fruit did not open up in the best of condition, and, in addition to this, shippers incurred extra expenses of about 2s. per case for cooling the fruit at port of distress.

Outports.

One direct shipment was made to Manchester, and although the result was not as favorable as was expected, the department is satisfied that shippers will do well to again avail themselves of the facilities of this port. The

charges are less than those of London, and had this consignment not arrived a day behind one of the large White Star boats, with a very large shipment of apples, the prices obtained would have been considerably better.

Varieties and Markets.

London.—It is essential that at all times the tastes and fancies of the consumer must be taken into consideration if the best results are to be obtained. In this direction it would be well to remember that the English buyers prefer Cleopatra, Jonathan, Cox's Orange Pippin, Dunn's Seedling, Blenheim Orange, Rome Beauty, and Spitzenburg.

Germany.—For the German market the recommendation is to ship Cleopatras, Dunn's Seedlings, Jonathans, Spitzenburg, London Pippins, and Strawberry Pippins (if good).

France.—The market for apples in France is of a variable character, but in normal years, despite the setback received this year, it is confidently expected that shippers can obtain at least 10s. per case, Port Adelaide, always providing that the packing is neat and good, and only large-sized apples are sent. Shipments must be made early and varieties must be strictly confined to Reinette du Canada, London Pippin, Five Crown, and Dunn's Seedlings. Colored apples are not wanted; hence it is hard to dispose of Jonathans. Here it must be mentioned that we have on previous occasions advised the shipping of this apple, but it has eventually transpired that our Jonathans do not correspond with the apple our French buyers know as such. Cleopatras are also difficult to sell, as their flavor is not appreciated by the French.

PEARS.

Vessel.	No. of cases.	Left Adelaide, 1909.	Gross Price Realised per Case.		Average Gross Price Realised per Shipper.		Average Price per Shipment.
			Highest.	Lowest.	Highest.	Lowest.	
Ormus ...	2	Jan. 28					
Orestes ...	904	Mar. 3	1 10 0	Nil	1 0 7	10 10	12 10
Sarpedon ...	1,157	Mar. 24	1 8 0	Nil	0 10 3	6 0	11 11
Telamon ...	753	Mar. 31	0 16 0	Nil	0 11 4	5 4	7 8
Asturias ...	45	April 8	0 11 0	9 0	0 9 10	9 10	9 10
Hector	537	April 15	1 4 0	6 0	0 14 3	13 9	14 1
	3,398						

PEARS SOLD IN LONDON.

		£ s. d. s. d.	£ s. d. s. d.	£ s. d.
Ormus ...	2	Jan. 28		Valueless
Orestes ...	904	Mar. 3	1 10 0	1 0 7
Sarpedon ...	1,157	Mar. 24	1 8 0	10 10
Telamon ...	753	Mar. 31	0 16 0	6 0
Asturias ...	45	April 8	0 11 0	5 4
Hector	537	April 15	1 4 0	7 8
	3,398			9 10

PEARS SOLD IN HAMBURG.

Rostock ...	24	April 2	0 15 2 7 10 0 14 9 14 9 14 9
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PEARS SOLD IN PARIS.

China	4	Mar. 4	No value.
	3,426		

There is always more or less an element of risk in the shipping of soft fruits, and it is extremely difficult to differentiate between the varieties to ship and those to dispose of locally. So much depends on details, such as the time of picking, the state of the weather at packing time, and, above all, the regularity of temperature during transit on ship. Vicar of Wingfield, L'Inconnue, Glou Morceau, Winter Nelis, Buerre Bosc, and Clairgeau have usually carried fairly well, but, speaking generally, Keiffer's Hybrid, Durondeau, Jersey, and Capiatumonts have varied considerably upon arrival. At times these sorts have landed well, but the risk is one that must play an important part in the quantity shipped. It will be seen by the above figures that this season has proved no exception to the rule, prices fluctuating very much. Splendid prices were obtained for consignments which landed in good condition, but, unfortunately for growers, the greater portion of the season's shipments arrived in an over-ripe condition. Glou Morceau pears have secured the most profitable prices this year, and on most occasions turned out in really good order. Each year the experience gained differs from that of the previous season, so much so that shippers are still uncertain in their operations. No two seasons work out alike. Varieties doing well in one year offer an inducement to shippers to increase the quantity the following season, only to find that this particular variety has landed badly, thus reversing the condition of the previous season. This trade is of such a speculative nature and has proved so discouraging to many shippers that no great increase in exports can be expected, at least until prices are more even and steady. As an illustration of the uncertainty in connection with the marketing of this fruit, it may be mentioned that one large shipper sent a portion of his Glou Morceaus in the *Sarpedon* and the balance per *Telamon*. Only four days elapsed between the arrival in London of the two vessels, yet while the 300 cases in the *Sarpedon* realised 15s. 9d. per case gross, London, those shipped in the *Telamon* only brought 9s. per case. The variety of fruit was similar, from the same garden, and both lots were sold by the Trades Commissioner in the same week. The market may have receded 1s. 9d. per case, so it can at least be assumed that the variation of temperature, or some unknown cause, contributed to a difference of 5s. per case. It may be mentioned that during the Franco-British Exhibition the Commercial Agent successfully kept in cool storage, from April until the end of October, 1908, a period of six months, such sorts as Winter Nelis, Easter Baurre, Forelle, and L'Inconnue.

MARKETING OF SOUTH AUSTRALIAN PRODUCE.

Lectures by the Trades Commissioner.

Between July and the end of October the Trades Commissioner in London (Major A. E. M. Norton, D.S.O.) delivered 40 lectures to the producers of South Australia in various parts of the State, dealing with the collection, packing, shipment, and disposal of South Australian produce in European markets. In order that the value of these lectures may not be lost, an official report of them in the form of one lecture was authorised. The following report embodies the substance of Major Norton's remarks at all the lectures:—

VAST SCOPE FOR INQUIRY.

Major Norton said—"Since leaving Adelaide, now nearly three years ago, I have had the honor of lecturing before all classes of people in the United Kingdom and many important commercial bodies. But that duty and the task which I have to perform this evening are essentially different, and the difference is appreciably felt by myself. When speaking in England I necessarily assumed that I knew my various subjects so much better than it was likely any of my hearers did, and accordingly I could, to put it colloquially, let myself go with every possible confidence. Now I recognise that the position is somewhat different. I am well aware that I may be addressing gentlemen who have had infinitely larger experience in the export world than I have had, although I hasten to assure you that, prior to my appointment as Government Trades Commissioner, I was not altogether a novice. It is with due deference and with certain timidity, therefore, that I venture to address you. I wish it to be perfectly clear that it is with no idea of teaching you how to conduct your businesses that I stand here, but rather to place before you for your consideration certain facts that have come under my notice during the three seasons I have been in the United Kingdom. Now my experience has shown me that I had as Government Trades Commissioner greater facilities for inquiring into matters relating to produce than would have been the case had I been a private individual. In the latter capacity I might have been eyed with a certain amount of suspicion and jealousy, perhaps; but in the former office the contrary obtained. I might say that at all times I was afforded assistance in my search for information. And I did search, because I early recognised that there was vast scope for inquiry, and that tireless and enterprising personal investigation was demanded.

IGNORANCE ABOUT SOUTH AUSTRALIA.

"But here I wish to say something on another subject. While I do not believe all that has been said and written about the ignorance that prevails in England about South Australia—for instance, the absurd idea that all Australians are black—there is unquestionably an element of ignorance and an element that must certainly detract from our position as a trading State. So

far as possible I have endeavored to improve matters by my lectures, and there is scope for more work yet. Men in a large way of business in the north of England do not know—or did not know—that currants are grown in South Australia or that fruit is canned here. They had heard of such things as Australian raisins but not of South Australian apples, and I have had inquiries where they can be bought. As I say, I have succeeded in a little reform effort, and I repeat here that exhibitions of produce throughout the provinces are highly essential to further success, and that it is absolutely necessary to have them backed up by supplies. Fancy big business men in England asking if South Australia grew apples or raisins or currants! Does it not seem preposterous? But I know, unfortunately, how true it is. In my lectures I used slides to show what produce was grown in South Australia, and how it was grown, and, if you will excuse the expression, I rubbed this in—the marvellous advance made by this State during the last 10 years in all phases of production.

MORE ADVERTISING.

"I do wish to drive home to the producers the value of having exhibits of our produce at the various leading shows throughout Great Britain, and then having assured supplies so that I can arrange with the larger retailers in these towns to stock our stuff and placard the fact prominently in their windows. You will have noticed that this year I have been able to have £1,000 passed on the Estimates for work of this character. This is a considerable increase on the sum previously allotted, but may I be pardoned for saying that it is not by any means big enough yet. Still, it has now become a progressive total I hope, and will eventually grow to adequate proportions. When I return to London I will be able to enlarge my policy of advertising. You must all agree how very necessary this work is in London, if we are to keep in touch with the markets and consumers. A lot of people have not seen our produce, or they may have done so and not known it. If they hear about it they are encouraged to inquire, and then, perhaps, to buy."

THE WHEAT EXHIBIT AT THE EXHIBITION.

"I was proud, indeed, of the wheat exhibit at the Franco-British Exhibition. Everybody who saw it said it was the finest of its kind in the whole of the Exhibition, including Canada. The important advantage of that display was the fact that the wheat was shown in commercial quantities in sacks. People were able to dive their hands in the bags and feel the grain. Other countries showed only small samples in bottles. I afterwards submitted big samples of every variety of wheat to one of the largest mills in the United Kingdom. To give you some idea of the importance and extent of this mill, I will mention just one fact. It has the most up-to-date laboratory in the United Kingdom, I asked the head of this mill to test these wheats, and to say what they were really worth to him from a milling standpoint. I was anxious to get a reliable basis of comparison. He gave me the analyses. I went through the laboratory to see how the testing was done, and I was given a very practical demonstration indeed. The relative values of the different varieties were clearly shown. I think I ought to say that it was due to the splendid generosity of Sir Edwin Smith that we had that magnificent display of wheats at the Franco-British Exhibition, because, I understand, he bought it at the show and gave it to the South Australian Government for that very important purpose. Only a few of the varieties I submitted to that English miller were considered really good."

THE WHEAT CABLES.

"I have been asked whether the wheat cables sent to Adelaide from London by the Trades Commissioner are 48 hours late as stated at the wheat commission. My answer is: No; certainly not. The cable leaves London at 4.45 on the same day as sales are made. Similar information does not appear in the London papers until the next day. Then the question has been put—'Are the cables of an optimistic nature as suggested by a witness at the wheat commission?' To that I reply that the cables sent are correct records of actual sales made. It is not the duty of the commercial agent to give his opinions in regard to the wheat market, but merely to state facts. The sources from which I secure my information concerning the wheat market which I cable daily to the South Australian Government are absolutely trustworthy. It is obtained from the Baltic Exchange, London. I have a similar arrangement with Liverpool.

DISTRIBUTION OF PRODUCE.

"I wish to say a word first about the distribution of our produce when it arrives in London, and to present to you some facts that I have gathered and some suggestions that have arisen as a result. When I reached London I was naturally strange, and to a certain extent isolated. But, after the first season, and when I had carefully looked round London, the principal outports, and the chief centres of consumption, particularly of perishable produce, I came to the conclusion that too much of our produce is centred in London, not only consignments from Australia but from New Zealand as well. You will agree that this was not a hasty conclusion by any means, and it was not drawn without reliable data. Of course, I do not wish for one moment to imply that London can be ignored, because that would obviously be absurd. My point is that, instead of dumping everything there as a kind of traditional practice, there are occasions, not a few but many, when our produce could profitably be distributed to the more important outports—such as Liverpool, Manchester, Avonmouth, Hull, Leith, and so on. I hold no brief for any of these ports as against London. I need hardly assure you, and perhaps it would not be amiss here to say that I am not in any way touting for business at these lectures. I want to clear that impression away absolutely. I am the Government Trades Commissioner; and in that capacity I represent and act for the whole of the State. I am speaking entirely from a national standpoint on behalf of the producers and merchants in whose interests I was appointed. Now I wish to return to my argument about the importance of paying attention to the large outports in the distribution of our produce. After having completed three years close and careful study of the various markets, and having made voluminous inquiries, I am more than ever convinced that my first impressions were right.

SMALLER CHARGES AT THE OUTPORTS.

"I do not, however, expect to make such a statement without being challenged. I suppose I will be. Arguments, I admit very strong ones, have been brought forward against what I am now saying. I will place all the facts before you as I have gathered them, and will ask you to weigh every point. Then, if you agree that my statements are worthy of your consideration, may I suggest that the various associations and interests represented will discuss the question so that the outports of Great Britain may be more thoroughly exploited; if, indeed, there is not scope for uniformity of action throughout Australia. My reasons for thinking that too much of our produce is being centred in London are: In the first place, because the dock charges, rates, and commissions are higher in London than in any other part of Great

Britain. Generally speaking the charges are at least one-third more in London. I will take each individual line as it came under my notice, both from inquiries and also from the actual handling of goods.

BRISTOL.

"I wish now to deal with some of the larger outports with which I am advocating business. First, by way of comparison with London, I will refer to Avonmouth (Bristol). I have time only to give a few contrasts of rates, charges, and so on. There are 10 million people within a 100-mile radius of Avonmouth. The splendid waterway between Bristol and the Midlands not only affords a cheap means of transit for traffic to go from that district, but necessarily has a considerable bearing on the rail rates from that port. Bristol is at present one of the most important centres in the country for the distribution of grain, butter, cheese, timber, fruit, and so on. Some of the largest works in the country are for the manufacture of iron and iron goods, tobacco, paints and colors, pottery, boots and shoes, and ready-made clothing. The largest ships arriving from Australia are able to go alongside the cold store, thus enabling carcasses to be lifted straight out of the ship into the stores. Accordingly, a minimum of handling obtained. Dock and storage charges are one-third less here than in London, and the Dock Company offers many facilities not obtainable in London. The following tables will illustrate the advantage in regard to charges, and, in a general sense, they may be taken as indicative of the position that attains at the various outports as compared with London. I think you will agree that the figures are very suggestive and warrant careful study. Put in a sentence the over-all charges, including 28 days' storage from Bristol to Birmingham, amount to 4½d. a case—I am taking apples as an instance—while from London the cost is 10⅔d. a case. This margin in favor of Bristol is one of considerable significance I think."

AUSTRALIAN PRODUCE TO BIRMINGHAM.

COMPARISON OF CHARGES INCLUSIVE OF ALL SERVICES FROM SHIP TO DESTINATION.

	Per Package.	BRISTOL.	LONDON.
		Per Package.	Per Package.
		s. d.	s. d.
Apples, 40lbs. per case, including 28 days' storage		0 4½	.. 0 10⅔
Butter, 62lbs. per case, including 28 days' cold storage		0 8½	.. 1 3
Frozen mutton, 50lbs. per carcass, including 28 days' cold storage		0 8½	.. 1 4½
Frozen lamb, 38lbs. per carcass, including 28 days' cold storage		0 7	.. 1 0½
Frozen beef, 188lbs. per quarter, including 28 days' cold storage		2 7½	.. 5 1
Eggs, 56lbs. per case, including 28 days' cold storage		0 9½	.. 3 7½
Honey, 132lbs. per case, including 28 days' storage		1 8½	.. 3 3

	Per Lb.	BRISTOL.	LONDON.
		Per Lb.	Per Lb.
		s. d.	s. d.
Apples, 40lbs. per case, including 28 days' storage		0 0½	.. 0 0½
Butter, 62lbs. per case, including 28 days' cold storage		0 0½	.. 0 0½
Frozen mutton, 50lbs. per carcass, including 28 days' cold storage		0 0½	.. 0 0½
Frozen lamb, 38lbs. per carcass, including 28 days' cold storage		0 0½	.. 0 0½
Frozen beef, 188lbs. per quarter, including 28 days' cold storage		0 0½	.. 0 0½
Eggs, 56lbs. per case, including 28 days' cold storage		0 0½	.. 0 0½
Honey, 132lbs. per case, including 28 days' storage		0 0½	.. 0 0½

<i>Per Ton Weight.</i>	BRISTOL.	LONDON.
	<i>Per Ton.</i>	<i>Per Ton.</i>
	<i>s. d.</i>	<i>s. d.</i>
Apples, 40lbs. per case, including 28 days' storage	17 5	.. 41 9
Butter, 62lbs. per case, including 28 days' cold storage	24 9	.. 45 3
Frozen mutton, 50lbs. per carcass, including 28 days' cold storage	32 2	.. 60 8
Frozen lamb, 38lbs. per carcass, including 28 days' cold storage	34 0	.. 60 8
Frozen beef, 188lbs. per quarter, including 28 days' cold storage	31 6	.. 60 8
Eggs, 56lbs. per case, including 28 days' cold storage	30 8	.. 145 4
Honey, 132lbs. per case, including 28 days' storage	29 10	.. 55 3

Certainly, the figures I have quoted concerning charges must appeal to business men.

LOW RATES TO BIRMINGHAM.

"I mention Birmingham because within a 10-mile radius there is a population of two million people. The return rates from Birmingham to Bristol are consequently low. For instance, the freight on bedsteads from Birmingham to Bristol is 17s. 6d. per ton as against Birmingham to London 23s. 7d., or a saving of 6s. 1d. in favor of Bristol. Several important shipping companies are already running to Avonmouth, including the Federal-Houlder Company, which now runs a monthly service at equal rates to London and also dock all their ships at the outport mentioned. The agents of this enterprising company have placed one of the windows of their office, which is situated in the main street in Bristol, at the disposal of the Trades Commissioner for the display of South Australian products.

"I wish to point this rather interesting fact out. It is the exception for the London Dock authorities to give any concessions, while similar authorities at the outports are only too willing to do business with you, and are courteous in the extreme. That is a consideration which I submit should weigh with us I think we should certainly think over the facilities which are being offered to us by the dock authorities at the more important outports of Great Britain.

LIVERPOOL AND MANCHESTER.

"Liverpool will already be so well known to most of you that I need not say more than that storage and other rates are also considerably less than in London. It is already well known that Manchester is the centre of an enormous manufacturing population, a class of consumers that prefer lamb of the South Australian type to any other. They do not like too much fat, and so far the average lamb from South Australia does not possess the same amount of fat as that from New Zealand and other countries. Generally speaking, the Lancashire mill-hands are large consumers of meat. At Manchester they have powerful grain elevators and five stores with the capacity for taking millions of bushels of wheat. Grain is discharged at the rate of 350 tons an hour. The docks extend to an enormous length. Ships come in one side and there is a railway on the other so there is practically little handling with rail and ocean facilities so close. The famous ship canal which runs from Eastham, on the River Mersey, to Manchester is 35½ miles in length and 28ft. deep, the bottom width and the full depth being 120ft. On the canal near the Manchester Docks we find the large refrigerating store of the Union Cold Storage Coy., Ltd., having a capacity of 175,000 carcasses, and specially constructed for the accommodation of Australasian frozen meat. The grain elevator and the docks has a storage capacity of 40,000 tons, or 1,500,000 bushels. Over 420,000 tons of grain are imported annually into Manchester. To demonstrate the advantage of Manchester as a distributing centre, it may be mentioned that 460 van-loads of bananas are dispatched by seven different railway companies from

the docks in one day. Take the dock constructor on the site of the old Manchester racecourse. It is 2,700ft. long and 450ft. wide. The ferro-concrete transit sheds are half a mile in length, and a portion of them are allocated to the Australian steamers. At this berth a portion of the transit shed has been converted into a refrigerated transit chamber with a capacity of 85,500 cub. ft. for receiving, sorting and loading to railway wagons or carts, frozen meat and other perishable products imported in refrigerator chambers. This provision is made in order to prevent the ships being detained while the carts and railway cars take the meat from alongside. Handling and the cost of transit are reduced to a minimum.

HULL.

"I have now dealt with the principal ports on the West Coast, where, as I have said, there are already regular lines of steamers running. I will now refer to the East Coast. Here, however, we are not so fortunate as regards regular steam service—at any rate, steamers with refrigerating accommodation. From inquiries I have made in London in this connection I feel sure that it is only a matter of inducement when they will be prepared to put in a considerable number of boats for frozen produce to the port of Hull which, judged by the money value of its imports and exports, ranks as the third port in the United Kingdom, with a total annual trade of over 70 millions sterling. I want to emphasise this to the Chamber of Commerce, and to suggest that they should work in with the Chambers of Commerce of the other States as I have pointed out. I have put the matter before the shipping people in London, and their answer is, 'What inducements will you give us?' That means that if we can put the stuff up in sufficient quantities they will take it to the out-ports.

AN IDEAL CENTRE.

"Hull is connected by canal as far south as Sheffield and Nottingham, north as far as York and west to Leeds, Wakefield, Bradford, and other large towns. There is a most active competition carried on over the waterways by independent carriers and the rates of transport are consequently reduced to a minimum. The low rates charged by canals necessarily reflect in the competing rail rates, and make the Port of Hull, as regards its cheapness and facilities, an ideal centre for the conduct of trade to the surrounding centres of population, consisting of about 10 million people. One of the main circumstances which contributes to the importance of Hull as a distributing centre is its geographical relation to the largest ports of Northern Europe, and to the coast ports of the United Kingdom. Between Hull and Rotterdam there is a daily service of first-rate boats, and the latter port is one of the main outlets connecting with the Rhine, and it accordingly touches many of the most important cities and centres of population in Germany, where we have already built up considerable direct trade. To and from Hamburg, and also Antwerp, there are three sailings per week, and to the northerly ports of Europe, such as Copenhagen and St. Petersburg, the steamers are the most speedy, regular, and frequent of any which sail from the United Kingdom. Butter to the extent of over 30,000 tons comes annually from Denmark to Hull, mainly for distribution to the adjacent thickly-populated districts. Having regard to the position of Denmark and Hull, and the relatively higher freights from Australia to London, it would seem that producers in the Commonwealth will have to seek more economic methods of distribution than those at present adopted if they are to capture the markets of the North of England. In competing with our Continental rivals we are seriously handicapped by the increased freight to cities such as Leeds, for instance, with its population of half-a-million. We have, in distributing from London, to pay a port and transit rate of 51s. 6d. per ton as compared with 32s 4d., the rate paid on Danish butter from Hull.

WASTE OF £20,000 ANNUALLY.

"Take Leeds again. The port and rail charges at and from London are 70s. 9d. per ton, whereas from Hull they are only 38s. 10d. Assuming that the whole of the meat imported into London from Australia is consumed in the various parts of the country in proportion to population, then the quantity forwarded from London to the area which Hull serves would be one-quarter or about 20,000 tons. Again, assuming that the average fees in rail rates from London as compared with Hull on this particular commodity are 20s. per ton, which I submit is a moderate estimate, the sum of £20,000 is unnecessarily wasted in export charges. That has to be unduly paid by the producer, to say nothing whatever of what is certainly lost by deterioration through extra handling.

IMPORTANT IMPORTS.

"The eggs imported into Hull come principally from Russia, Denmark, Germany and Belgium, those imported from Russian ports being to a large extent originally drawn from as far as Manchuria, and some months necessarily elapse between their collection and the depots belonging to the importers—that have been established in various quarters of the countries from which the eggs proceed—and their being sold to the consumer in the United Kingdom. There are quite a number of importers in Hull through whom exports from Australia could be distributed. Sometimes these eggs are placed in cold stores and sometimes in the egg warehouse.

"Between the months of May and September inclusive a large quantity of continental soft fruit is discharged at the Hull Riverside Quay, which is accessible at any state of the tide, and here assemblies of buyers from all parts of the Kingdom and the Continent congregate, and during these months the Hull fruit sales are more numerously attended than any similar sales in the United Kingdom. In the absence of direct steamers from such places as Australia a large quantity of fruit imported through London and Liverpool is put on to rails at those ports and sent to Hull, where it is sold very largely to consumers within the area of distribution, but principally to Continental buyers. The expenses attending the conveyance by rail across the country are necessarily heavy, and of course would become unnecessary in the event of direct sailings being established.

"The imports of leather from South Australia into the United Kingdom are largely sent to the boot-making districts of Leeds, Leicestershire, Northamptonshire and Staffordshire, and Hull being comparatively near these districts ought certainly to secure a large proportion of this trade.

"In regard to coal, assuming that a liner took 4,000 tons of bunker coal for her trip to Australia, £1,000 per voyage could be saved by coaling at Hull as against London. Hull is the nearest of the largest ports of the United Kingdom to the world-famed coalfields of Derbyshire, South Yorkshire and Nottinghamshire, whose output is about 65,000,000 tons annually.

"No difficulty may be feared in the matter of cold storage accommodation should the Australian producer decide to use the port of Hull as a distributing centre.

"Metals and ores imported into Hull are destined for the South Wales, Birmingham, South Staffordshire, Newcastle, Sheffield, and West Riding districts. The rates of conveyance from Hull to Birmingham and South Staffordshire are, generally speaking, about the same as from London; but are less for the Newcastle and Sheffield districts and the West Riding than from either London or Liverpool, and to South Wales and Newcastle there is an excellent service of coasting steamers and low freights by which a transhipment trade could be developed.

" Hull is perhaps the most important centre in the world for the crushing of seed and the manufacturing of oil. The seed is conveyed from the docks to the mills on the banks of the River Hull, where it is converted into oil and also oil-cake for cattle-feeding. There are a large number of distributing agents at the port who could be employed in the disposal of Australian oils, which are principally used for soap-making. Having regard to the presence of a large number of soap manufactories and the enormous quantity of engines and machinery constantly employed in the West Riding, which lies practically at the doorstep of Hull, and in other parts of the distributive area, it would appear that a large proportion of the oil could be more economically imported into and sold from Hull than London. The same remark applies also to South Australian tallow and stearine.

" Hull as a milling centre is next in importance in the United Kingdom to Liverpool. The grain is discharged from the vessels into lighters for conveyance to the various flour mills on the banks of the Humber and its tributaries, the Ouse, Trent, and Hull. At Hull wharfage cannot be charged unless imported articles pass over the quay, and this makes for the great economy which has contributed so much to its advantage as a port. Thus it is that the wheat steamers may be seen discharging with their stern end on to the quay so that the lighters may surround them.

" Hull has an enormous importation of wool, a fairly large exportation of which commodity is made from Australia.

ROOM FOR ECONOMY.

" In regard to wool, let me give an illustration of the economy that would be effected if advantage were taken of the remarkable geographical position of Hull as an approach to the markets of the northern and midland counties. There are annually disposed of at the London sales, about 600,000 bales, or 100,000 tons of wool, which, having been bought, are sent for consumption to the mills of the West Riding of Yorkshire. The rate of conveyance from Hull to Bradford, to which city it is mainly sent, is 15s. per ton. From London the rate is 30s. per ton. It is further estimated that the port charges for landing, wharfage, delivery to warehouse, storing, opening out for inspection, delivery to carriers, and so forth, are about 10s. per ton less at Hull than at London. It will be seen from this that the annual amount at the present time paid by the grower or manufacturer, or partially by both, is 25s. per ton, or on 100,000 tons, £125,000 in excess of the amount which would have to be paid were the wool sent to Hull for sale and distribution. A relatively small proportion of the wool is, however, purchased by representatives of the West Riding merchants, who attend the sales in Australia and New Zealand, and some proportion of this is brought direct from Australia and New Zealand ports to Hull.

THE PORT'S ADVANTAGES SUMMARISED.

" Where necessary the motive power for the manipulation of goods is electricity, provided by the municipality, and this largely contributes to the rapidity of the transporting operations. The advantages of Hull in relation to prospective trade with Australia had been summed up by the Hon. T. A. Coghlan in the following words:—'There could be no question that for any manufacturing centre within reach of Hull, the advantage in the way of cheapness was very greatly in its favor as compared with London. That advantage ranged from 12s. to 25s. per ton, and for all exports to Australia the average was about 18s. When it was considered that the average value of goods exported from the United Kingdom to Australia did not exceed £18 per ton,

the extra charges paid in London over those paid in Hull worked out to the equivalent of an export duty of 5 per cent. all round. If the matter had come home to traders in that way, viz., that to land and deliver goods at London they must pay an import or export duty of 5 per cent., which they would not pay if those goods had been landed or shipped from Hull, there could be no question but that a considerable amount of attention would have been drawn to the subject, and there would have been a movement either to redress the charges or to remove the trade."

APPLES AND OTHER FRUIT.

Now, I want to say something about apples for a little while. I suppose you have all heard it said that Floral Hall, Covent Garden, is the only proper place to sell our apples. I do not agree with that, and I intend to give reasons why I do not. In the first place I do not see why that should be the case with South Australian fruit any more than with Canadian apples, bananas, oranges or anything else. If it is essential that all our apples should go to Covent Garden, why is it not essential for every other country to send their fruit there? The proportion of Canadian apples sold at Covent Garden is very, very small. They find their way into Manchester, Liverpool, Hull and Bristol. The argument in favor of sending all our fruit to Floral Hall to be sold is illogical and unbusinesslike, and I hope to convince you on that score. I know you have had gentlemen in Australia from London saying that it is the right thing to do. Far too much of our produce goes to Floral Hall. I do not mean to say that we can do without auction. I think there are times when it is advisable to auction our fruit; but I do not think the system that obtains in Floral Hall by any means the best. Rather the contrary opinion would be true. I do not think the buyer has a proper chance.

WHAT HAPPENS.

"This is what happens. A boat arrives with fruit, and the documents having been fixed up, the fruit is delivered at Covent Garden. A few cases are sent along to Floral Hall for the auction. The sale may be advertised for 10 o'clock, but it is often nearer midday before business begins. There is, in my opinion, not sufficient opportunity given of properly seeing the fruit when it is being sold. This is something like the scene: There are about eight auctioneers, four on either side of the building, and when the bidding starts, and they all start at the same time, you cannot imagine the confusion. There is such a babble of voices and such a jostling that you are far happier outside. The building is only about twice as big as the hall of the Adelaide Post Office and you can picture that crowded with buyers after produce. The auctioneer stands on a raised platform, and porters bring cases hurriedly forward. The lid is knocked off and the case tipped on end. The people immediately in the front certainly can see the fruit, but what of those crushed at the back. How can they bid intelligently? It is unreasonable to expect them to do so. How is our fruit to attain its proper value with such a system obtaining? It is a haphazard, hurried kind of auction, with absolutely no facilities for necessary inspection. Many of the retailers to whom I spoke agreed with me that they do not get a proper chance, and that the fruit is not fairly treated. Since I have been in Adelaide I have met a local representative of Covent Garden, and he practically admitted at a public meeting that the system that obtained there was not by any means the best. I am certain of it, and I challenge anybody to prove that I am wrong in my judgment.

THE MODERN SYSTEM OF AUCTION.

"Now I will explain the system I consider to be infinitely preferable and which obtains in other countries. I am taking for illustration a saleroom at Hamburg, but the same principle has now been adopted in parts of Great Britain. When a shipment comes in, before the sale, the apples are displayed in a large room, and prospective buyers may inspect all the marks. They have plenty of time to note the virtues or vices of the different consignments. They can take all day if they like. If one particular shipper has a superior grade of fruit the buyers have the opportunity of seeing it and making a note on their catalogues. Fifty may take notice of it, and you can imagine the effect that must have on the bidding. The next day the bidding takes place. The buyers sit around desks as they do at a wool auction. The lines for which a man intends to bid are ticked off on his catalogue. There is proper, efficient competition, and the best article wins the advantage of merit. The buyers have seen the fruit and they are satisfied, and I certainly think the consignors should be. That, at any rate, is my idea of a public auction.

METHOD OF THE TRADES COMMISSIONER.

"I say again that at times I consider it necessary to have public auctions. My method of dealing with produce sent through the depot could be adopted by others. What I have done you could do. When a shipment arrives I generally go down to the ship and inspect it. I ought to tell you here that it does not take long for an unfavorable report of a shipment to get around even a big place like London. It circulates like wildfire. That is the time when you have to watch things very closely, or you may lose heavily in apparently most innocent circumstances. You may get in your account sales showing so much waste, so much fruit rotten, so much bitter pit, and so on. It is wonderful how much damage there is if you do not happen to see the consignment yourself. So I made it clear that I would not recognise any account sales showing waste unless I had seen the damaged fruit myself. When you do see the produce it is equally marvellous how the waste can be reduced practically to a minimum.

"The trouble of slack cases has been mentioned to me. We are doing our best to minimise the difficulty. If there is anything short in the way of packing I want to see it myself. My advice is to be as careful as you can when you pack your fruit. I have reason to believe that pilfering goes on at the London Docks while the fruit is stacked there. You could have a better chance in this direction at the outports. At the London docks there is considerable handling. Your agent, however, can minimise the trouble with a little energy and watchfulness.

AN EXCELLENT IDEA.

"I note the condition of the fruit when it arrives. The good fruit I send to the market immediately, if rates are favorable, and I auction the stuff that is forward. I naturally get rid of it as quickly as possible. This is particularly the case with pears. I have come to an arrangement with one of the principal salesmen in London to do my selling business for me. I send him the shipping documents. He clears the stuff, sorts it out, and puts it into a big store. I go there with him and inspect each mark. He does the selling or I do. He gets his commission just the same. I know where the fruit is going to, and I have a right to know to whom it is being sold. I know our customers, and you will agree that that is very important. Last year my returns were very satisfactory. I always get better information by going to the man

who is doing the retailing. I introduced that system at the Franco-British Exhibition with, I may say without egotism, considerable success. South Australia had a fine show of apples there. I saw some of the leading retailers in London. I said to them, 'I want to be able to tell the public where to buy the apples showing at the Franco-British Exhibition. If you stock them I'll put up a card saying that these apples may be purchased from So-and-So. The result was that several big stores had a whole window of apples branded "South Australian apples." I followed up that idea with excellent results. By that means I consider it is just as easy to get rid of 100,000 cases as 10,000 cases. I do not say that only I could, but others could if they only watched the fruit at the other end. It is largely a matter of following up the consignments when they have landed in London, and seeing that they do not lose their identity.

DEMAND FOR OUTSIDE CENTRES.

"I have been referring to the scope for establishing markets at the chief outports. The class of people that live around large centres like Birmingham, Bradford, Leeds, Cardiff, &c., and can be reached from the outports at cheaper rates than London. That is another reason why these markets should be exploited. The workers of London cannot give more than 3d. per pound for apples, and that means buying them for about 7s. per case at most. I understand that to land apples in London for 6s. a case is ruinous, and that you might as well give them to the pigs. The total charges just about amount to that. Therefore the market in London is limited for our apples, because, although they have millions they are not the class of millions that can afford to pay the profitable prices. Speaking generally, they get low wages and have large families to keep. The manufacturing classes in Leeds, Cardiff, Bristol, and Manchester, are better paid, and therefore have greater purchasing powers. All the apples that go into Covent Garden are not consumed in London by any means. Big buyers from the large outports go to London to buy apples.

TRADE WITH GERMANY.

"At present a considerable direct trade is being done in apples and pears in Germany. In Denmark, too, the business is opening up successfully; but unfortunately at the present time all Australian apples have to be transhipped to the latter country from London, while Hull is by far the better port for transhipment to the continent. I will give you an instance of what I mean. There was a very glutted market of apples in London, and I thought it advisable, as other large shipments were due, to tranship some to Hamburg. I wired to my agent at Hamburg and asked him the condition of the market. He told me that if I could get fruit there in a given time I was pretty sure to get a good price, and that if I failed there would be a direct shipment in and prices would fall. I made inquiries in London about a boat and ascertained that one was about to sail that would get the consignment at Hamburg at the due time to catch the market. A big and serious disadvantage about London is that these coastwise steamers do not lie anywhere near the sites where the ocean steamers berth. That meant that, in order to have the fruit conveyed from one steamer to the other, I would have to engage lighters. That involved a risk, and I was not prepared to take any risks just then. So I hired vans. I watched the whole process of transferring the cases myself, so as to make sure that no time would be wasted. There was some trouble in getting away from the docks, and the result was that by the time we had reached the wharf, where the Hamburg steamer had berthed, she had gone. Still, the fruit had to go, and it reached Hamburg just too late. The direct shipment had come in. If

that had been at Hull, the Hamburg boat would have been right alongside the other boat, and we would easily have caught a good market with the fruit. At Hull and the other outports every possible facility is given to transhipment.

SEND THE RIGHT STUFF.

"A lot of apples came to England last year should have been dumped into the river. Although I have strongly advocated continuity of shipments a few good consignments are always preferable to a lot of bad ones. The effect of those defective cargoes was to bring the market down, and to depreciate the prices of good quality fruit. In connection with the Commerce Act, I would like to suggest that the inspectors under it should be given more power. It would be to the advantage of shippers right through. It is not for me to discuss the Commerce Act, but it is essential that we should prevent rubbish from being shipped. I should think that an efficient Commerce Act could, if properly administered, have a very beneficial effect on the export industry by preventing defective produce from being shipped. I certainly think the Act could be a little more stringent, because obviously indifferent fruit reduces the price of the good article. You must watch, too, the various varieties that are in favor in different countries and try and meet the spirit of the market. You need to be most watchful. If you ship only the best there is a big field open to you for a long time yet. I had an instance of a grower sending fruit to England marked 'Affected with Codlin Moth.' Fancy trying to sell that stuff to people having no idea of the nature of the disease. That man wrote to me and asked me to do the best I could 'as the apples are not half as bad as stated.'

BEST APPLES FOR EXPORT.

"Different countries require and demand different kinds of apples. It is no use our sending them what we consider best. We must send them what they want. Germany likes colored apples; Paris does not. Our shipments to Paris have brought satisfactory prices where the varieties requested have been sent. In order to ascertain the types wanted by these different countries I had models made of the export kinds and took them about with me. They were of great assistance and saved quite a lot of complexities over language. A big buyer in Paris said, when I showed him a model of Cleopatra's—'Don't send us those. We don't like them.'

"There is always a limited sale for a certain quantity of large apples in London. The medium size is most popular because it is naturally prepared for dessert purposes.

(To be continued.)



THE WHEAT MARKET.

The wheat market is more interesting in December and January than in any other months of the year, for probably quite one-third of the wheat crop is sold between the middle of December and the middle of January in such a year as the present one. Last year new season's wheat brought 3s. 9½d. per bushel at the beginning of December, and the price dropped to 3s. 7½d. at Christmastime and remained at that figure until January 9th, when it advanced 1d. This year 4s. was the ruling price at the beginning of December, and there has been an excited and rising market throughout the month, the top price of 4s. 3½d. per bushel being reached on January 8th.

For purposes of comparison the following table of average prices for each month will be interesting:—

Month.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.
	s. d	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	2 7	2 8	2 10	2 11	5 10	2 10	3 5	3 3	2 10½	4 2	3 8
Feb. .	2 8	2 8½	2 8½	3 2	5 10	3 4	3 5	3 2	2 11½	3 9½	3 10½
March .	2 7½	2 8½	2 8½	3 5	5 10	3 1	3 3	3 2	2 11½	3 10½	4 2½
April ..	2 8	2 8½	2 8	3 9	5 8	2 10	3 3	3 2½	3 1½	3 10	4 9
May ..	2 8	2 8½	2 10	4 0	5 4	2 11	3 3	3 3½	3 7½	4 1	4 10½
June ..	2 10	2 10	2 9	3 10½	5 4	2 11	3	3	3 7	3 9½	4 10
July ..	2 11	2 11	2 10	4 1	5 4	3 1	3 4½	3 3½	3 9	3 8½	4 10
August	2 10	2 10	2 10	4 4	5 4	3 5	3 4	3 2	3 9½	3 10	4 6½
Sept. .	2 11½	2 10	2 10½	4 7½	4 10	3 6	3 7½	3 2	3 11	3 10½	4 6
October	3 1	2 8½	2 10½	4 9	5 0	3 4	3 7½	3 1	4 9	3 9½	4 6
Nov. .	2 11	2 8½	2 10½	5 1	3 3	3 3	3 8	3 0½	4 5	3 9½	4 2½
Dec. ..	2 7½	2 9	2 9	5 1	2 11	3 8	2 5	3 3	3 11½	3 9	4 0½
Average price for each year	2 9	2 9	2 9½	4 1	5 0½	3 2	3 5	3 2	3 7½	3 10½	4 5

The present high prices are largely due to the keen European demand. *Beerbohm's Evening Corn Trade List* on November 26th wrote—"While there is no appearance of any material change in prices it is not very probable that consumers at the present range of values would take more wheat than would be sufficient for current requirements; that is to say, they are not likely to reconstitute stocks except at a somewhat lower level, for although prices are distinctly below the level of a few months ago, they are still much above the average of ordinary seasons. The position is a very interesting one. Against the facts that this year's total wheat crop has proved to be a very large one, and that shipments so far have been on an enormous scale, one has to bear in mind that at the commencement of the season stocks all over the world, both in first and second hands were extremely low, that the world's requirements increase materially year by year, and that farmers have become so accustomed to a fairly high level that they will be reluctant sellers at any material decline."

Broomhall's Corn Trade News points out that last season the net imports of Europe amounted to only 51,000,000qrs., and that this season already 23,000,000qrs. have been imported and put out of sight, indicating an annual consumption of over 70,000,000qrs. This rate of importation is not likely to be kept up, but the paper says that the season in the main will be one of large requirements.

Date.	LONDON (Previous Day).						SYDNEY Per Bushel.
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	
Dec. 6	—	..	..	..	..	..	4/5 to 4/6; 3/11 to 3/11½ Jan.
7	Quiet	..	..	..	..	..	4/-; 3/11½ to 4/- (Dec.-Jan.)
8	Quiet	..	..	..	..	..	4/-; 3/11 to 4/- n.s.
9	Quiet	..	..	..	..	..	4/-; 3/11 to 4/- n.s.
10	Steady	..	..	..	..	..	4/-; 3/11½ to 4/- n.s.
11	Very dull;	January	4/10½d.	..	..	..	4/-; 3/11½ to 4/- n.s.
12	—	..	..	..	..	..	4/-; 3/11½ to 4/- n.s.
13	—	..	..	..	..	..	4/-; 3/11½ to 4/½ n.s.
14	Dec. 4/11½	Jan. 4/10½	steamer;	Jan. 4/10½	sailor	..	4/5; 3/11½ n.s.
	Liverpool Dec. 4/11½	steamer;	Dec. 4/9½	sailor	..	..	4/5 to 4/6; 3/11½ to 4/- Dec.; 3/11½ Jan.
15	Jan. 4/9½	sailor	..	..	..	..	4/5; 4/- Dec.-Jan.
16	Quiet	..	..	..	..	..	4/-; 4/1 n.s...
17	Dec. 4/11½	steamer;	Liverpool 5/-	steamer	..	..	4/0½ to 4/1 n.s...
18	Dec. 4/11½	steamer;	Jan. & Feb. 4/10½	sailor	..	..	4/0½ to 4/1 n.s...
19	Liverpool 5/1½	steamer;	..	..	..	..	4/1½ Dec.; 4/1 Jan. ..
20	—	..	..	..	..	..	Do.
21	Quiet, easier tendency	..	..	..	..	..	4/2 Dec.; 4/1½ Jan. ..
22	Quiet	..	..	..	..	..	Jan. 4/1 to 4/1½ ..
23	Quiet	..	..	..	..	..	4/1 to 4/1½ ..
24	Dull, easier tendency	..	..	..	..	..	4/1 to 4/1½ to 4/2 p.
25	—	..	..	..	..	..	Do.
26	—	..	..	..	..	..	Do.
27	—	..	..	..	..	..	Do.
28	—	..	..	..	..	..	Do.
29	Firm; quiet	..	..	..	..	..	4/1; 4/1½ p. ..
30	—	..	..	..	..	..	4/1 to 4/1½ ..
31	—	..	..	..	..	..	4/1 to 4/1½ ..
Jan. 1	Firm; 4/10½	Dec., sailer	..	..	..	..	Do.
2	—	..	..	..	..	..	Do.
3	5/0½	Dec., steamer; 4/11 Dec., sailer	..	..	..	..	Do.
4	London 5½	Jan., sailer; 5/1½ Dec., steamer	..	..	..	..	4/2 p. ..
5	London 5½	Dec. & Jan., sailer	..	..	..	..	4/2 to 4/2½ ..
6	Firm; Liverpool sellers asking 3d.	to 3d. per bush.	..	..	..	..	Do.
	advance	..	..	..	..	..	..

STEAMER FREIGHTS.—Port Adelaide to London, 26/- per ton (8½d. per bush.); Port Adelaide to South Africa, 22½d per ton (7½d. per bush.). A lot of tramp steamers have been chartered at 27/- per ton (8½d. per bush.) for January loading; 26/6 per ton (8½d. per bush.). Port Adelaide to Sydney, 13/- per ton (4½d. per bush.). March. Port Adelaide to Melbourne 10/- per ton (3½d. per bush.). Port

SAILER FREIGHTS.—Sailing vessels have been passed over during the past month in favor of steamers to a great extent, but a little business has been done at 22½ to 23½ per ton (7½d. to 7½d. per bush.). Sailer business to South Africa has been done at 20/- per ton (6½d. per bush.).

RAINFALL TABLE.

The following table shows the rainfall for December, 1909, at the undermentioned stations, also the average annual rainfall, and the total rainfall for 1909 and 1908 respectively :—

Station.	For Dec., 1909.	Avg'e. Annual Rainfall	Total Rainfall for 1909	Total Rainfall for 1908	Station.	For Dec., 1909.	Avg'e. Annual Rainfall	Total Rainfall for 1909	Total Rainfall for 1908
Adelaide	0.33	20.33	27.69	24.47	Hamley Brdg. . . .	0.57	16.28	21.11	16.75
Hawker	0.25	11.96	13.89	14.36	Kapunda	0.55	19.61	25.43	18.53
Cradock	—	10.52	11.60	12.47	Freeing	0.51	17.64	22.26	18.11
Wilson	0.59	11.52	13.14	13.75	Stockwell	0.55	20.16	22.82	20.08
Gordon	—	9.13	12.22	14.54	Nuriootpa	0.58	21.11	27.62	21.95
Quorn	0.05	13.57	14.89	16.55	Angaston	0.51	21.64	29.07	22.27
Pt. Augusta . . .	0.01	9.16	12.87	13.73	Tanunda	0.53	21.78	28.49	21.78
Pt. Germein . . .	0.11	12.30	15.23	18.46	Lyndoch	0.62	22.66	29.09	25.24
Port Pirie	0.42	12.69	13.96	16.91	Mallala	0.34	16.60	21.78	18.09
Crystal Brook . .	0.37	15.07	18.16	18.64	Roseworthy	0.54	17.12	23.77	17.41
Pt. Broughton . .	0.06	14.03	16.45	15.71	Gawler	0.46	19.13	25.77	18.26
Bute	0.39	14.88	19.21	18.37	Smithfield	0.39	16.44	22.17	20.27
Hammond	0.06	10.72	14.58	18.63	Two Wells	0.38	16.40	19.89	16.06
Bruce	0.01	8.91	11.04	19.90	Virginia	0.31	17.34	22.90	18.53
Wilmington . . .	0.32	17.72	20.33	25.64	Salisbury	0.28	18.27	23.95	18.98
Melrose	0.23	22.72	28.40	37.70	Teatree Gully . . .	0.57	26.96	33.07	36.05
Booleroo Cntr. .	0.14	15.75	17.06	19.78	Magill	0.64	24.88	37.39	29.38
Wirrabara	0.36	18.43	22.96	20.70	Mitcham	0.68	23.44	30.82	25.69
Appila	0.40	14.68	17.11	20.70	Crafers	1.63	45.58	68.63	50.26
Laura	0.82	17.55	24.31	26.77	Clarendon	0.62	33.68	42.23	31.99
Caltowie	0.29	16.96	18.78	23.95	Morphett Vale . . .	0.35	23.15	30.75	22.38
Jamestown	0.38	16.98	20.18	21.32	Noarlunga	0.32	19.93	27.57	22.13
Gladstone	0.35	15.63	16.68	21.52	Willunga	0.54	25.67	36.14	24.53
Georgetown	0.26	17.95	18.41	21.50	Aldinga	0.33	19.65	29.67	20.46
Narridy	0.16	16.81	16.22	18.65	Normanville	0.43	20.43	25.67	20.57
Redhill	0.13	16.30	20.03	22.58	Yankalilla	0.53	21.25	30.02	24.01
Koolunga	0.09	15.89	18.71	20.70	Eudunda	0.02	16.86	15.47	19.26
Carrieton	0.06	11.78	14.45	15.76	Sutherlands	0.05	9.79	12.28	—
Eurelia	0.12	12.92	13.75	18.43	Truro	0.61	19.22	25.47	21.36
Johnsburg	0.10	9.74	12.40	12.06	Palmer	0.36	14.76	18.71	14.88
Orroroo	0.08	13.33	13.91	15.92	Mt. Pleasant	0.80	26.64	32.94	28.59
Black Rock	0.19	11.94	14.41	15.46	Blumberg	0.61	29.25	36.63	30.65
Petersburg	0.13	12.80	13.24	17.13	Gumeracha	1.03	32.94	46.98	34.34
Yongala	0.18	13.59	15.83	17.11	Lobethal	0.96	35.27	47.78	34.79
Terowie	0.09	13.44	15.59	16.58	Woodside	0.72	31.08	46.14	33.85
Yarcowie	—	13.43	15.65	18.66	Hahndorf	0.75	35.13	48.09	35.00
Hallett	0.19	16.21	15.00	21.30	Nairne	0.68	28.51	39.50	27.12
Mt. Bryan	0.08	15.35	14.98	16.28	Mt. Barker	0.61	30.84	40.20	27.61
Burra	0.08	17.64	18.17	21.11	Echunga	0.83	32.24	48.31	31.98
Snowtown	0.13	15.38	19.13	21.53	Macclesfield	0.84	30.21	41.57	30.06
Brinkworth	0.09	14.36	17.17	20.16	Meadows	1.03	34.96	47.25	34.20
Blyth	0.40	15.81	22.33	21.54	Strathalbyn	0.47	18.89	28.98	20.96
Clare	0.41	24.12	28.92	27.59	Callington	0.18	15.63	20.39	15.69
Mintaro Cntrl. . .	0.19	21.90	25.26	23.47	Langhorne's B . . .	0.34	15.21	19.72	15.98
Watervale	0.44	27.13	32.16	30.38	Milang	0.36	16.36	18.13	17.05
Auburn	0.66	24.00	33.39	27.69	Wallaroo	0.23	13.67	18.16	17.66
Manoora	0.34	18.06	21.47	18.76	Kadina	0.25	15.65	19.91	17.10
Hoyleton	0.30	17.99	20.20	19.40	Moonta	0.05	15.01	20.32	17.69
Balaklava	0.30	17.83	18.86	18.19	Green's Plains . . .	0.26	15.43	21.05	20.60
Pt. Wakefield . .	0.63	12.79	16.12	16.03	Maitland	1.01	19.80	26.68	21.35
Saddleworth . . .	0.43	19.81	22.0 ^c	19.13	Ardrossan	0.46	13.63	17.82	18.26
Marrabel	0.32	18.97	25.45	19.94	Pt. Victoria	0.79	14.90	19.63	16.83
Riverton	0.44	20.40	25.46	20.12	Curramulka	0.42	18.49	22.99	15.91
Tarlee	0.53	17.38	21.85	15.99	Minlaton	0.48	17.32	21.53	15.08
Stockport	0.36	15.93	17.81	14.65	Stansbury	0.34	16.73	22.74	17.07

RAINFALL TABLE—*continued.*

Station.	For Dec., 1909.	Avg'e. Annual Rainfall	Total Rainfall for 1909	Total Rainfall for 1908	Station.	For Dec., 1909.	Avg'e. Annual Rainfall	Total Rainfall for 1909	Total Rainfall for 1908
Warooka	0·26	17·46	18·74	16·69	Bordertown ...	0·39	19·90	23·19	17·80
Yorketown....	0·22	17·39	18·74	16·07	Wolseley	0·34	17·54	23·09	17·53
Edithburgh ..	0·68	16·38	18·51	14·41	Frances	0·48	20·57	23·85	16·70
Fowler's Bay..	—	12·06	13·74	12·83	Naracoorte....	0·96	22·42	27·16	20·74
Streaky Bay ..	0·02	15·11	18·39	14·31	Lucindale	1·15	22·76	29·47	22·39
Pt. Ellioton ..	0·06	15·98	18·28	18·49	Penola	0·91	26·66	30·72	25·00
Pt. Lincoln ..	0·45	19·83	19·85	19·28	Millicent	1·67	28·64	33·80	28·17
Cowell	—	11·70	10·73	15·70	Mt. Gambier..	1·88	31·60	41·85	28·55
Queenscliff ..	0·52	18·31	20·21	17·54	Wellington ..	0·61	14·89	20·24	15·54
Port Elliot ..	0·60	20·39	21·33	18·22	Murray Bridge	0·45	14·05	20·28	14·37
Goolwa	0·69	17·56	24·49	18·70	Mannum	0·09	11·62	22·69	21·04
Meningie	0·92	18·81	24·24	18·02	Morgan	0·02	9·10	8·34	8·11
Kingston	1·06	24·28	30·50	26·09	O'rland Corner	0·06	11·28	9·66	12·43
Robe	0·97	24·53	30·92	22·07	Remark	0·10	10·78	10·92	10·06
Beachport	1·47	26·74	33·83	26·06	Lameroo.....	0·09	—	18·29	17·71
Coonalpyn	0·42	17·43	23·14	16·43					

DAIRY AND FARM PRODUCE MARKETS.

The Produce Export Department reports on January 1st:—

BUTTER.—The Department's expectations for December have been fully realised. The cool state of the weather has assisted materially in both quantity and quality of cream supplied, as shown by the excess over the corresponding month of last year. The prices have been steadily rising, and the demand is still on the increase. The market quotations for the day are—superfine, 1s ; pure creamery, 1d.

Eggs.—Last month showed fairly active inter-State demand, with Melbourne throughout willing to pay better figures than either Sydney or Perth. Considerable business was done with Melbourne buyers, the graded circle eggs having strong inquiry. A fair turnover was obtained with Sydney, while the Western business was small, owing to large local supplies. The prices ranged from 7½d. to 8½d. per dozen during the month for ordinary to 8½d. to 9½d. for graded.

Messrs A. W. Sandford & Co. report on January 1st:—

FLOUR.—City brands, old season's, £10 1 s.; country, old season's £10 5s.; city brands new season's, £9 10s.; country, new season's, £9 5s. per ton of 2,000lbs.

BRAN.—1s. 1d.; new season's, 11d. to 11½d. **POLLARD.**—1s. 2d.; new season's, 11d. to 11½d. per bushel of 24lbs.

OATS.—Local Algerians, 1s. 6d. to 1s. 7d. per bushel of 40lbs.

BARLEY.—Cape, new, 2s. to 2s. 4d per bushel of 50lbs.

CHAFF.—£3 to £3 2s. 1d. f.o.b. Port Adelaide per ton of 2,210lbs.

POTATOES.—New locals, 7s per ton of 2, 40lbs.

ONIONS.—New locals, £4 per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 11d. to 1s.; choice separators, dairies, to second grade factories, 9½d. to 10½d. per lb.; weather-affected dairies and separators, 7½d. to 8d.; stores and collectors, 7d. to 8d.

CHEDDRE.—Factory makes, 5d. to 6d. for large to loaf, new make; matured up to 8½d. per lb.

BACON.—Factory-cured sides, 9d. to 9½d. per lb.

HAMS.—In calico, 1s

EGGS.—Loose, 8½d. per doz.

LARD.—Skins, 6½d.; tins or bulk cases, 6d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb. Beeswax, 1s. per lb.

ALMONDS (scarce).—Soft shells, Brandis, 7d.; kernels, 1s. 4d.; mixed soft shells, 6½d. per lb.

LIVE POULTRY.—Good table roosters, 3s 6d. to 4s. each; cockerels, 2s. 7d. to 2s. 9d.; plump hens, 2s. to 2s. 6d.; ducks, 1s. 11d. to 2s. 7d.; geese, 2s. 6d. to 3s. 3d.; pigeons, 8d.; turkeys, 11d. to 1s. 1½d. per lb live weight, for good to very prime table birds.

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Jan.	Feb.			Jan.	Feb.
Amyton		—	—	Meningie	*	22	26
Angaston	536	22	19	Merghiny	*	—	—
Appila-Yarrowie	*	—	—	Millicent	*	11	8
Arden Vale & Wyacca	*	—	—	Miltalie	539	1	5
Arthurton	*	—	—	Minalton	*	—	5
Balaklava	*	—	—	Moonta	*	—	—
Beetaloo Valley	534	—	—	Morchart	*	—	—
Belalie North		22	19	Morgan	*	—	—
Bowhill	†	—	—	Morphett Vale	†	—	—
Brinkworth	*	—	22	Mount Bryan	*	—	—
Bute	*	—	—	Mount Bryan East	*	1	5
Butler	*	—	—	Mount Gambier	546	8	—
Caltowie	*	24	21	Mount Pleasant	*	—	11
Carrieton	*	20	24	Mount Remarkable	*	—	24
Cherry Gardens	542	25	22	Mundoora	—	—	—
Clare	537	21	18	Nantawarra	538	—	23
Clarendon	*	24	21	Naracoorte	*	8	12
Colton	*	22	26	Narryd	*	—	—
Coomooroo	532	24	—	Northfield	*	—	—
Coonalpyn	540	—	—	Orroroo	*	—	—
Cradock	*	—	—	Parrakie	541	1	5
Crystal Brook	*	—	—	Paskeville	*	22	19
Cummins	538	22	19	Penola	547	—	12
Davenport	532	—	—	Penong	*	—	12
Dawson		22	—	Petina	540	—	—
Dingabledinga	543	14	11	Pine Forest	*	—	22
Dowlingville	*	—	—	Port Broughton	*	21	18
Forest Range	*	20	24	Port Elliot	544	15	19
Forster	541	—	—	Port Germien	*	—	—
Fowler Bay	*	22	19	Port Pirie	*	15	—
Frances		—	—	Quorn	*	—	—
Freeling	537	—	—	Redhill	*	15	19
Gawler River	*	—	—	Renmark	*	—	—
Georgetown	*	22	26	Rhine Villa	541	—	—
Geranium	*	29	26	Riverton	*	22	19
Golden Grove	543	26	24	Saddleworth	*	21	18
Goode	*	—	—	Salisbury	†	4	1
Green Patch	*	24	21	Shannon	539	—	—
Gumeracha	†	—	—	Sherlock	†	—	—
Hartley	*	22	19	Smoky Bay	*	—	—
Hawker	†	—	—	Stansbury	*	—	—
Hookina	533	22	19	Stockport	*	—	—
Inkerman	*	20	24	Strathalbyn	*	17	21
Johnsburg	*	—	—	Sutherlands	*	—	—
Kadina	*	20	24	Tatiara	*	—	—
Kalangadoo	545	8	12	Uraidiia and Summert'n	*	—	7
Kanmantoo	544	21	18	Utera Plains	*	22	19
Keith	546	—	2	Virginia	*	—	—
Kingscote	544	—	7	Waikerie	542	—	—
Kingston	*	29	26	Watervale	538	—	—
Koolunga	*	25	22	Wepowie	*	—	—
Koppio	539	—	—	Whyte-Yarcowie	535	—	—
Kybybolite	*	20	17	Wild Horse Plains	*	—	—
Lameroo		—	—	Willunga	*	1	5
Lipson	*	—	—	Wilka Watt	†	—	—
Longwood	*	21	23	Wilmington	533	22	24
Lucindale	*	29	—	Wirrabara	534	—	—
Lyndoch	*	—	—	Woodside	*	—	—
Maitland	*	—	5	Yallunda	*	—	—
Mallala	*	—	5	Yongala Vale	*	—	—
Mannum	*	—	—	Yorketown	*	8	12
Meadows	*	—	—				

* No report received during the month of December.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Coomooree, November 29.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Brice (chair), J. and Jer. Brown, H. and L. Avery, Hall, and Kildea (Hon. Sec.).

HARVESTING.—Discussion took place on the seasonable topic of harvesting. Mr. Brice spoke of the choking of strippers, a trouble which he had largely overcome by adjusting the machine with the beaters as close to the combs as possible. It was considered that the wider combs of the harvesters were less liable to choking than the strippers. Others mentioned that damp-weather strippers and harvesters broke up a lot of smut balls as contrasted with the ordinary stripper. The harvester was thought to be more useful than the last-named machine, as with it it was possible to get the grain off in damp weather. A disadvantage, however, was the fact that it blew a lot of small seeds on to the land which could be separated if winnowed, and then be destroyed by fire.

SMUT ON BARLEY GRASS.—Members wished to know whether smut from barley grass would affect the crops. [The only crop which might possibly be affected would be barley, as the fungus is quite distinct from those which attack wheat and oats.—Ed.]

Davenport, December 9.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Bothwell (chair), Roberts, Bice, Hewitson, Hogan, and Lecky (Hon. Sec.).

HORSES FOR FARM WORK.—The Chairman read the following paper on this subject:—“There is no doubt that the greater number of draught horses in the Australian States owe their origin to the old English cart horse. He was not attractive in appearance, but he would pull at all times. He was slow and sure. With the better roads of modern times the horse required was one that would do the work in less time. To meet this need the farmers of Suffolk and Norfolk bred a horse known as the Suffolk. This was a plain breed of horse, and had many defects, but a great improvement on the predecessor. This breed was improved almost out of recognition, until we have what is known as the improved Suffolk Punch, and there are some worthy representatives of this useful breed in South Australia, and, indeed, in this district. The improved Suffolk Punch horses are of a bright chestnut or liver color, somewhat lighter than the original. They have low, powerful shoulders, with plenty of slope where a well-fitting collar will remain firmly while the horse is at work. A nice round barrel, legs clean and wiry, giving one the impression of lightness of the cannon bone; but that is more apparent than real. This horse is an active, powerful animal, with a good constitution, and it is claimed by some that he will do a given amount of work on less feed than any other. Whether this be true or not, it is worthy of mention that it is more economical to keep stock in good condition than to put condition on. Another good breed is the Clydesdale, which is rather heavier than the Suffolk Punch. Some contend that this is a more active horse, but of this I am very doubtful. The Clydesdale has a very neat head, light neck, a round barrel, very deep at the girth, although somewhat higher than the Suffolk. On account of the shortness of the legs this animal is very deceptive as to height, often being 16 hands 2in. and over, and yet not looking a high horse. Being good walkers, they are most suitable for dray or farm work. Some are of opinion that this breed is not so hardy as others, but I do not know of any proof of that assertion. They are capable of getting along with heavy loads over stiff clay ground at a fair pace. The Shire horse is one of immense proportions, capable of drawing a big load, and has been displaced in England to a great extent by a lighter and more active animal. Although I have advocated a horse of medium weight as the best for farm work for the reason that he is more active, if you can get animals combining size and activity so much the better. These two qualities

however, are seldom found together, and bad feet are more common with the big horses than those of medium weight. In my opinion a horse of either the Suffolk or Clydesdale strain is the most suitable for farm work, and it must not be forgotten that the care of the foal has a lot to do with the usefulness of the horse. How often do we find a mare with a foal at foot receiving barely enough food to sustain her own life, without contributing the nourishment required for her offspring? If there is not sufficient natural pasture it will pay to give enough feed to keep the mare in condition and the foal growing. Frequently one sees a miserable, pot-bellied foal, with hair standing on end through want of sufficient food or unsuitable food. Such a foal has lost what it never will regain in its growing period. As a horse does not come to maturity until at least five years old, it should never be put to hard and long continuous work until reaching that age. Feeding has a lot to do with the amount of work a horse will perform, and the horse that is bred on the right lines will respond more generously to the care bestowed on him. Australia, with its genial climate and wealth of succulent and nutritious grasses, is a most suitable country for horse-breeding, and the Australian horses have not lost any of the stamina or other good qualities of the imported stock. On the other hand, they have shown a decided improvement and development, and are not liable to many diseases common in the old world."

Hookina, December 24.

PRESENT.—Messrs. Woods (chair), L. Woods, A., W. P., J., and J. Henschke, jun., Stone, Kelly, Sheridan, and Madigan (Hon. Sec.).

FOWL TICK.—Discussion on this subject was introduced by Mr. Kelly who had been advised to use grease on the fowls' perches to kill the tick. He found, however, that the pest thrived very well on this treatment. He had also used kerosine on the perches with good effect for a time, but after a few days it seemed to be of no more value. Mr. Henschke said the way to combat the pest was to use iron posts and iron perches. Mr. Sheridan used an old set of harrows raised on a frame. To treat fowls which had the tick adhering to them the Hon. Secretary recommended using sheep dip, and would choose a hot day so that the fowls might dry quickly. Mr. A. Henschke thought a good plan was to cover the fowl roost with wire-netting and let the fowls roost on the netting. Mr. F. Stone suggested making fowl roosts of dry acacia trees, and burning them when they became infested with the tick. [Any woodwork in connection with the fowlhouse forms an excellent harbor for tick, and a good plan is to build the place entirely of iron and then fix by thin wires, tightly strained, the perches. The perches themselves might in that case be made of some hard wood free from cracks, and could be wiped over with kerosine occasionally. It is said that the tick will not travel along a thin wire.—ED.]

Wilmington, November 25.

(Average annual rainfall, 17½ in.)

PRESENT.—Messrs. Slee (chair), Scholefield, Farrell, J. and G. Schuppan, W. and S. Robertson, Hoskins, Noll, George, Payne, Zimmermann and Jericho (Hon. Sec.).

SECOND FLOWERING OF WHEAT.—Referring to Mr. Davis's paper on "Haymaking," read at the Adelaide Congress, members were agreed that there was no second flowering of wheat, but that so soon as the male portion of the flower had disappeared the flowering was over.

EXAMINATION OF STALLIONS.—Mr. Noll considered the action taken by the Government regarding the examination of stallions was a step in the right direction. Although in some ways it might be a drawback to country shows, these shows were held for the purpose of showing *good* animals, and quality should come first. Stallions should be sound, and without any blemish whatever.

Wilmington, December 23.

(Average annual rainfall, 17½ in.)

PRESENT.—Messrs. Slee (chair), D. and S. George, Payne, Scholefield, Farrell, Schuppan, Heard, Robertson, and Jericho (Hon. Sec.).

SHEEP-BREEDING.—Mr. Robertson read a paper on this subject. In view of the fact that nearly every farmer in the district kept a few hundred sheep, the question of the breed was very important. Considering, first of all, the wool, the Merino was the best kind of sheep, unless for very rough country. It could adapt itself to existing conditions more readily than any other type, and the price brought by the wool was higher and

fluctuated less than any of the long-woollen or crossbred sheep. Experience had shown, however, that in a climate similar to that of this district the finer-woollen sheep would not produce the satisfactory results that were obtained from more robust wool, because the delicate fibre of the fine-woollen Merino was very susceptible to the withering effects of the heat. Further, the sheep which grew robust wool always had a large frame, and there was always a strong demand for these in the market. If considering the question of lamb-production rather than of wool, the early maturing properties of the Shropshire strain should be combined with the other desirable features of the Merino in a crossbred. In this way good paying wool is produced from the ewes and the Shropshire ram begets a good crossbred lamb.

EXPERIMENTAL PLOTS.—Mr. Schuppan reported on the Government experimental plots. The average yield was about 17 bush. per acre. The application of lime had proved to be very beneficial; possibly this was partly governed by the wet winter experienced.

BUNT.—Mr. George reported that he had reaped 55 acres of wheat grown from unpickled seed and had seen no smut (bunt) whatever. He had reaped with one harvester 377 bags of Yandilla King wheat in three and a half days.

Wirrabara, December 4.

(Average annual rainfall, 30 in.)

PRESENT.—MESSRS. Lawson (chair), Blesing, Curnow, Marner, Lomman, C. and J. Hollett, W., W. H., and E. J. Stevens, H. E. and A. Woodlands, Kendrick, Pitman, Hunt, and H. Lawson (Hon. Sec.).

ADVANTAGES OF KEEPING PIGS.—Mr. A. B. Blesing read a paper setting forth the advantages to be derived from keeping a few pigs, both by gardeners and farmers. Gardeners at times had a lot of waste fruit, such as windfalls and low-grade stuff, and apples affected with codlin moth, which, instead of being left to rot in the garden or sent in to glut the market, could be fed to pigs and turned into pork and bacon. The farmer also had a still wider range of waste and offal which could be used for pig feed—such as cracked grain, screenings, waste from the stable, skim milk, and many other things. It would be granted that dairymen should never be without pigs (except those near the towns who had a milk round), for there is nearly as much profit in skim milk if fed to pigs as there is in cream, when allowance has been made for the labor involved. To be profitable pigs should not be kept longer than 12 months old, unless for breeding purposes. For the best results they should not be confined in a small sty, but should be provided with a yard in which to exercise. A good plan was to have two small paddocks adjoining the sty that could be sown early in the season with quick-growing fodder, and when fit could be fed off alternately. Lucerne, provided the soil was suitable, was the best fodder to grow. The best breed to keep depended upon circumstances and requirements. If an abundance of feed was available the Berkshire, Poland-China, White Yorkshire, or Tamworth were of about equal value, while the Essex was the poor man's pig, and would keep in good condition when others would almost starve. Probably the best for general farm use was a cross between the Essex boar and Berkshire sow.

CHANGING SEED WHEAT.—Mr. Woodlands wished to know whether it was advisable to have frequent change in seed wheat. Mr. Hollett was of opinion that it was beneficial to have changes occasionally, while Mr. Lomman thought it almost essential to have changes in the seed of any crop sometimes. Mr. Blesing had reaped better crops since he changed the seed.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, November 22.

PRESENT.—MESSRS. Fradd (chair), Burton, Bird, J. J. and J. A. Ryan, Woodford, A. and F. Bartrum, Petrie, Joyce, Jacobie, Murphy (Hon. Sec.), and two visitors.

DIEBACK IN FRUIT TREES.—In reply to a question as to how to deal with this trouble, members considered the best treatment was cutting back and giving a good application of stable manure.

UNMARKETABLE FRUIT.—Mr. J. A. Ryan read a paper on this subject, in which he advocated picking up all fallen fruit at least twice a day to prevent injury by the sun. If any part damaged by birds were cut off, the remainder of many varieties could be dried or made into jam. Apples, apricots, and figs, and the yellow peaches could be dried or would make excellent jam. The white-fleshed peaches were not so good for these purposes. They became too soft for drying and made a poorer sample of jam. Surplus pears he found more difficult to deal with, as, with the exception of the stewing varieties, they were of no use for either purpose. All soft and inferior fruit unfit for other use should be given to fowls or pigs. They were very good for this purpose in the summer, when there was no green feed. He did not grow quinces. Members generally agreed with the paper.

STRIPPER AND HARVESTER.—A paper on this subject was read by Mr. Jacobie. Figures were given to show that, with crops of about 16bush. during a period of several years, the harvester did its work at a less cost than the stripper, while with an 8bush. crop the stripper was the more economical machine to use. Most members were in favor of the harvester, provided the ground was not too hilly. It was considered that the advantage of being able to reap in cool and damp weather with the harvester more than compensated for any cost involved in repairs. It was also said to be impossible sometimes to get the wheat cleaned when wanted owing to the scarcity of labor. Big losses through the damage to wheat were occasioned by this.

Whyte-Yarcowie, November 30.

(Average annual rainfall, 13½in.)

PRESENT.—Messrs. Pearce (chair), Pascoe, Hunt, Jenkins, A. and F. Mitchell, McCann, Lock (Hon. Sec.), and one visitor.

EXPERIMENTAL WORK.—The Chairman read the following paper on this subject:—“It has often been affirmed that experience is the best teacher. I think we might go further and question whether there is any other teacher. It is doubtful if one ever learns anything fully except by experience; it is not necessary to go far for illustrations to prove this. A man of average intelligence purchases a new binder, for instance, of the working of which he has had no practical experience; he goes to an expert and has the whole thing explained as clearly as language can do it; everything seems quite clear to him. He starts off with the machine. Possibly everything runs smoothly for a time, but presently something goes amiss with the tying gear. Now, a dozen things may go amiss with such a complicated piece of machinery. Of little use is all the explanation of the expert previous to the starting of the machine; but let him happen along now, and he can put his finger on the spot and remedy the defect, because experience has taught him that this particular machine behaves so only when a particular part is defective or wrongly adjusted; the novice learns eventually. If such is the case with a piece of machinery, how much more is it true that the farmer (who is working in conjunction with natural laws, of which he may be said to know little more than the ABC) needs to seek knowledge and confirm theory by experiment. And yet how little, after all, is done in this direction; we seem too ready always to leave such work to the other fellow, and let someone else do the work and take the risk. If he is successful we copy. All improved methods of cultivation, the use of improved machinery and fertilisers, were in the first instance an experiment by some isolated individuals. It cannot be allowed for one moment that the necessity for experiments has ceased, or that we have arrived at perfection in our methods. In regard to wheat-growing I do not think it possible to overestimate the importance of careful surface cultivation. We are probably all agreed, however, that there is room for experimental work, to prove the advantages and practicability of a deeper stirring of the subsoil of our red clay land. It is very noticeable this season that wheat on such lands has suffered in comparison with that on soil of a looser nature, and the evil becomes intensified from year to year by surface cultivation. The use of farmyard manure, carefully and lightly applied, has been found beneficial. Great care is necessary, however, or its application will cause the crop to blight on the first dry spell in the spring. The risk of this, I believe, could be greatly reduced if the subsoil could be stirred to a depth of 8in. I have been confirmed in this theory this season by noticing that a crop on one end of a paddock, which for some years was used as a road, has been blighted badly. This particular piece of land is seldom ploughed more than 3in. to 4in., and below that it is almost as hard and impervious as it was when a road. An examination of this soil reveals a mass of matted fibrous roots at a depth of about 2in. or 3in. Probably an application of lime to the surface of our red lands would also prove very beneficial, but the cost of lime is a serious item. Personally I believe deeper cultivation and the application of farmyard manure the most practical method of improving the soils. As you are aware, I am in charge of an experiment with high *v.* low grade supers, for the Agricultural Department. Incidentally this will also be a comparison between heavy and light dressings of supers. There is not at present sufficient difference in the appearance of the various plots to base any decided opinion upon, but each plot will be harvested separately and carefully, and the result published.

The test is as follows :—Plot 1, 100lbs. S.A. super.; 2, 100lbs. mineral super.; 3, 115lbs. S.A. super.; 4, No manure; and 5, 60lbs. S.A. super. The plots are of two acres area each, and the manure was drilled with 1bush. Yandilla King wheat to the acre. All came up well, but none of them at present looks equal to the average of the general crop, which fact I attribute, partly at least, to the seed having been sent from another district. The selection of seed for each farm is another important matter for experiment. It is a wise plan to test new varieties on a small scale at first. I am aware there are objections to this method, such as the trouble of harvesting small quantities and the fact of not having a large return, even when a good variety is found, but against this you have the advantage of acclimatising the seed and proving its value over two or three seasons before sowing on a large scale. Last season I sowed a pound each of three varieties through the drill, and harvested them with the harvester without very much waste of time. In this way one can find out which varieties of wheat do best on his own farm, and can be continually looking out for a better. On my farm, considering one season with another, I have found Yandilla King a good all-round wheat to yield, and it is among the best for hay. It will also be found that a variety of wheat that will do well on one part of a farm will not do so well on another. On the lowlying red land, which is poor in nitrogen and humus, Marshall's No. 3 has been very successful, on my farm. We hear much of new hay wheats, such as Huguenot and Indian Runner. Extraordinary prices are being asked and paid for seed of it. As long as chaff merchants are prepared to pay the same price per ton as for ordinary wheaten hay, it is all right, but it seems doubtful whether such a stemming and reedy-looking growth will contain the nourishing elements of ordinary hay. Here again experience will decide, but it will be wise to go slowly at present. In conclusion let me give a brief summary of the results of pickling seed wheat. I have tried most of the pickles recommended during recent years—formalin, fungusine, and during the last two years Hackett's economic smut dressing. I think, so far, the last is the most successful. It is convenient to use. The last is bluestone, to which is added other ingredients, claimed to prevent the seed from being eaten by birds and insects, and said also to neutralise the ill effects of bluestone on the germination of the seed. The former claim I have not verified; the latter I have, and this season I shall satisfy myself as to its smut-preventing properties."

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, November 27.

(Average annual rainfall, 21½ in.)

PRESENT.—Messrs. Stephens (chair), Sibley, Waters, Player, Wishart, Thorne, Roberts, Friend, Plush, Ball, Matthews (Hon. Sec.), and two visitors.

BOTFLY.—The Chairman commented upon the prevalence of botflies in the district and urged members to take action in regard to the pest.

EUCALYPTUS OINTMENT.—A mixture of eucalyptus oil and lard was said to be an excellent remedy for cuts and wounds in horses.

FRUIT FROM THE FREEZERS.—Mr. Thorne tabled some apples and oranges which he had obtained from cold storage on his visit as a delegate to the West Australian Fruit Conference and gave some information in respect to his visit.

KANGAROO ISLAND.—Mr. R. Player gave an account of a recent trip to Kangaroo Island. The country round Hog Bay, he said, reminded him somewhat of Angaston. It was very hilly and the hillsides were covered with dandelions and other herbage similar to that found in this district. Mr. S. O. Smith's farm was well worth visiting. It was Bay of Biscay soil similar to the land about Freealing and Roseworthy, with patches of limestone showing here and there. One part was a rich slope facing north-east and the remainder tableland. It is rather difficult to climb, but there were hundreds of acres suitable for agriculture on that high land. The barley crop on this farm was magnificent. One part, nearly up to his shoulder, should yield up to eight bags to the acre. The feed on land which was cropped last year was abundant. In some parts clovers were growing luxuriantly from 3ft. to 4ft. high. Proceeding with Mr. Smith to his brothers' property at Hawk's Nest he had a journey of between 20 miles and 30 miles through scrub country. Fences were only seen when approaching a settler's farm, and these were few and far between. The scrub passed through was broom, dwarfed honeysuckle, yacka, &c. The country was undulating and patches of rich green were seen from

the tops of the rises, showing where the scrub roller had been at work and crops of wheat or barley raised. A great deal of work had been done at the farm of Messrs. Smith & Sons. The soil was of an ironstone nature, spongy and loamy, with a proportion of fine earth and a fair amount of ironstone nodules freely scattered through it. The subsoil generally consisted of a yellow clay, sometimes being but a few inches below the surface, but more generally being from 9in. to 12in. below. No doubt the soil would be improved by the addition of organic matter, and, judging by a crop of peas seen, this could be accomplished by ploughing in similar crops as green manure. Plenty of working is also necessary for these soils to overcome the sourness. Reference was made to the yacca gum industry and the distillation of eucalyptus oil, and an interesting account given of a trip up American River.

Clare, November 28.

(Average annual rainfall, 24 $\frac{1}{2}$ in.)

PRESENT.—Messrs. McCarthy (chair), Forbes, Bowman, Lee, Lockyer, McKenzie, Nolan, Pascoe, Miller, Pryor, Kelly, Jarman, Berridge, Daly, Radford, and Knappstein (Hon. Sec.).

WOOLLY APHIS, OR AMERICAN BLIGHT.—Mr. Knappstein wished to know of a cheap and effective way of destroying this pest. Mr. McCarthy recommended red oil for a winter spray and tobacco for a summer spray to destroy the aphis on the limbs of the fruit trees. Mr. Prior recommended strong lime water, with a couple of spoonfuls of kerosine added to every 4galls., as an effective method of destroying the aphis on the roots of the fruit trees.

PROTECTION AND PLANTING OF TIMBER.—Mr. Radford read the following paper:—“In the first place I would like you to take notice of two striking object lessons in the surrounding neighborhood. First, the rapidity with which the country is being denuded of its natural timber growth. Thirty years ago I went with a picnic party to Blyth Plains for the purpose of getting wild peaches, and we got them, too—wheat bags full; and some children, though only straying about a mile or so, were lost for hours where now we have only a bare plain—though at present a fertile one. And now the same process is going on in the hills, and thousands of tons of wood are being sent away yearly, and with all this no planting is going on. If this be not altered we shall experience a wood famine in this district within 30 years. Now, the other object lesson is the grand plantation at Hill River homestead. Here we see what can be done by planting and taking care of useful trees, and the style of trees that can be grown here. Taking these facts into consideration, that our present supply of even posts and firewood is rapidly diminishing, and that good timber can be grown in the district, what is our duty as members of the Bureau and citizens of Clare? I would say to apply to Government to establish at once, if possible, a forest in this district, and, if not, to offer attractions to private persons to induce the systematic planting of useful timber in large quantities. I recognise that this question besides being an urgent one should be a national one, and by what is written in the papers it seems to be a world-wide national one. Private individuals will hardly take up in these days of hurry to be rich an enterprise the returns of which may not be great for 50 years. I would advocate planting large blocks, and not belts or strips, as I think small blocks would harbor vermin and be a nuisance to surrounding orchardists.” Mr. Radford also read some of the most important points of the debate in the Legislative Council on afforestation. Mr. Nolan thought that afforestation was a question that should be taken up by the Government, and gave evidence of how the Governments of England and United States of America were taking action in regard to afforestation by planting all waste lands in their respective countries with suitable commercial timber.

VISIT TO “GLENBURNIE.”—At the kind invitation of Mr. W. Pattullo 11 of the members of this Branch went out to “Glenburnie” on Saturday afternoon, October 30th. Mr. Pattullo courteously showed the members over his well-kept orchard and vineyard, and explained his system of working them. After inspecting everything an adjournment was made to the spacious barn, where the host kindly provided light refreshments. A hearty vote of thanks to Mr. Pattullo brought the visit to a close.

Freeling, December 10.

(Average annual rainfall, 17 $\frac{1}{2}$ in.)

PRESENT.—Messrs. J. A. Mattiske (chair), Shanahan, Heinrich, Elix, Nenke, Neldner, A. Mattiske, Neindorf, and Block (Hon. Sec.).

TAKEALL.—A general discussion took place on this subject. Mr. Neldner thought it would be beneficial to use Thomas phosphate. Mr. Heinrich considered that rotation

of crops should be resorted to as soon as the takeall appeared. Such crops as oats, peas, etc., he thought would serve to kill the cause of the trouble. Members were of opinion that new ground in this district should be worked well before cropping.

SOIL ANALYSIS.—A member wished to know whether there was any simple method by which a farmer could analyse his soil to find out in what constituents of plant food it was deficient. [Soil analysis is necessarily an intricate and difficult matter, and can only be accomplished by the chemist in his laboratory. It is well known that the constituents usually lacking are nitrogen, potash, and phosphoric acid. Fortunately for the South Australian farmer, there is generally sufficient of all the elements except the last, and this is applied in superphosphate. The way for the farmer to find out whether his soil is deficient in either of the other two constituents is to apply some in experimental plots, and carefully weigh and record resulting crops. Nitrogen is applied by means of either sulphate of ammonia or nitrate of soda and blood and bone manures and potash in muriate or sulphate of potash. Growing and ploughing in leguminous crops, as is well known, adds nitrogen to the soil.—Ed.]

Nantawarra, November 24.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. J. Nicholls (chair), E. and A. Herbert, Sutton, Sleep, R. Nicholls, Gosden (Hon. Sec.), and two visitors.

HUNTER RIVER LUCERNE.—Mr. R. Nicholls tabled a splendid plant of this lucerne which was grown on his farm in light soil. Some of it had grown to a height of 38½in.

HORSE v. MOTOR POWER.—Mr. Sleep initiated discussion on the subject of power for farm work. Speakers were of opinion that the time was rapidly approaching when horse power on farms would give place to motor power. Although engines were costly the same was equally true of horses. It was considered that the motor plough could do its work more quickly than horses and at less cost. Various forms of motive power were discussed, and although members could not agree as to which would lead the way, they were confident that the many difficulties would be overcome in the near future.

Watervale, November 22.

(Average annual rainfall, 27in.)

PRESENT.—Messrs. Sobels (chair), Hamp, Scovell, Guthrie, and Duke Hon. Sec.).

SULTANA AND CurrANT VINE PRUNING.—A discussion on this subject took place, and it was suggested that it would be advisable to utilise new rods each year, cutting back after the second year's growth. The chairman had seen this method adopted with very good results.

WESTERN DISTRICT.

Cummins, November 27.

PRESENT.—Messrs. Cooper (chair), Sabey, R. Sivior, Potter, Atkinson, Roe, Hamilton, Durain, Nosworthy, Sivior (Hon. Sec.), and five visitors.

SHEEP ON THE FARM.—Mr. R. Sivior read a paper on the subject. He said that every farmer should keep enough sheep for the household mutton supply. He preferred to buy them off shearers in preference to attempting to breed in this district. The most profitable breed for the district was the Merino. These did not trouble the fences and gave a good clip of wool, provided they were properly treated. A plentiful supply of fresh water should be kept in clean troughs, and if the best use of the feed was to be made the paddocks should not be too large. He emphasised the value of sheep in manuring the land and keeping the fallow clean, and thought that if freezing works were erected at Port Lincoln, breeding lambs for export could be carried on very extensively in the district. For this purpose he recommended strong, large-framed Merino ewes mated with pure Lincoln rams. The ewe lambs from this cross made good mothers, and frequently bore twins. These again he would mate with pure Shropshire rams. In purchasing a ram it was a

great mistake to be too sparing, as the best animal procurable should be obtained if good lambs were to be expected. In regard to the age for lambing he thought four-tooth ewes were young enough for mating, but would sooner have full-mouths, as they were better mothers. Tailing could be commenced when the lambs were a month old.

Koppio, November 25.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), W. T. and H. Roberts, Newell, Howard, Richardson (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—A homestead meeting was held on Mr. Newell's farm for the purpose of inspecting the wheat plots under his supervision. Evidence of the damage done by the hot winds some time back was seen over a large portion of the crops, those most badly affected being Yandilla King and Silver King. The early varieties looked the best, viz., King's Early, Neuman's Early, Gluyas, and Federation, owing to their having escaped the hot winds. The later varieties were all more or less burnt. All the plots were sown with 1bush. of seed and 1cwt. of mineral super. Mr. Newell has a very up-to-date and complete chaffcutting plant driven by a 4½ h.p. motor engine, which was greatly admired by members. He stated that he was thoroughly satisfied with the engine, and intended working the winnower with it. Members were then entertained at tea by Mr. and Mrs. Newell, after which hearty thanks were tendered them.

Koppio, December 23.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. G. Howard (chair), M. Howard, G. B. and M. Gardiner, Thompson, and Richardson (Hon. Sec.).

LOSS OF A HORSE.—Mr. Thompson reported the loss of a horse through stoppage, and asked members' advice as to best treatment for similar cases. Some members recommended purging the animal with medicine; others thought it would be better to give an enema, as that was not so severe a method.

BOTFLIES.—It was reported that botflies were very troublesome this year.

Miltalie, November 27.

(Average annual rainfall, 14½in.)

PRESENT.—Messrs. F. Jacobs (chair), G. W. and J. W. Story, J. Jacobs, Smith, Howell, Laffin, Fairbank, Hier (Hon. Sec.), and four visitors.

FARM MANAGEMENT.—Mr. Howell read a short paper on the subject of farm management. Working horses, he said, needed regular attention and a stable. Sheds should be erected for machinery and implements. A fair amount of water could be conserved on any farm with a rainfall of not less than 12in. for a reasonable outlay. A certain amount of accommodation should be provided for laborers, and fixed hours for meals should be observed. Necessary Sunday work should be apportioned so that no trouble may arise. A farmer should not be long without a wife or housekeeper. A few sheep would pay without doubt, and every effort should be made to keep vermin in check.

WATER CONSERVATION.—Discussing this subject, some members thought it would be more economical in the long run to have tanks than dams. Others, considering the value of time, thought dams best in spite of loss by evaporation, on account of the rapidity with which they could be excavated and made.

Shannon, November 27.

PRESENT.—Messrs. Neate (chair), H. and W. Glover, W. and H. Proctor, Carey, Fleming, Williams, Smith, J., M., and J. J. Cronin (Hon. Sec.).

BOTFLY.—In reply to a question it was stated that a mixture of six parts of oil with one of turpentine, rubbed on the horses when the botflies were prevalent, was a good safeguard.

TAKEALL.—The Chairman was of opinion that takeall was not caused by a grub, but by cropping too frequently. If land was fallowed and cropped only once every three years he

believed takeall would disappear. Where rubbish had been ploughed in, such as stinkwort or stubble, the crop seemed to suffer from takeall. Mr. Glover had burnt the stubble of a crop affected, hoping to prevent a recurrence of the trouble, but the succeeding crop was worse than ever. [The Chairman is correct in his view that the trouble is not caused by a grub. The fungus responsible for the damage to the stem is well known, but the difficulty so far has been to find effective preventive measures. It has been proved many times that the fungus cannot live on oats, and growing this cereal for a time has cleared the land of it for a while at least. The use of Thomas' phosphate and sowing after rain has also been recommended. - Eb.]

Petina, November 20.

(Average annual rainfall, 12½ in.)

PRESENT.—Messrs. Venner (chair), D. and J. Kenny, Wharf, Keiley, Goodheart, Souter, (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. D. T. Kenny, and members drove round the wheat crop to inspect it. Yandilla King, Federation, Carmichael's Eclipse, and Silver King, all sown with 30lbs. or 40lbs. of mineral super. and about 50lbs. of seed to the acre, looked very well, the Silver King and Yandilla King being the best.

PRICE OF WHEAT AT PERLUBIE.—Mr. D. Kenny read a paper on this subject. There was an opinion prevalent that farmers had not received full value for their produce, and he advocated appointing one of their number to weigh and sample all their wheat. If there were two grades to make two stacks, and then it could be sold on its merits. According to his plan the person weighing the wheat should give a receipt to each farmer for all received from him, and if the farmer should desire to have money paid before the wheat was shipped he thought arrangements could be made with the bank to advance at least 15s. in the pound. In a few years they would probably be able to build a shed at the port to protect their own wheat and bags from the weather, and this could be practically paid for by what they gained from selling in bulk. In his opinion the merchant at present had it all his own way. He paid no jetty dues, cut the farmers of this district to 1d. per bushel less than Streaky Bay price, decided the weight with his own scales, and the farmers were afraid to do anything, or he might find a smut ball and cut down the price 1d. per bushel. For these reasons he advocated some such arrangement as suggested, and felt sure the result would be that merchants would soon be running after the farmers instead of, as at present, the reverse being the case. A good discussion followed, members being divided in opinion as to the practicability of the scheme.

TIRES AND DRAUGHT.—A discussion took place on the question of tires following the reading of an extract on the subject which stated that the draught was very much less with tires 6in. wide either in sandy or boggy soil than was the case with those of a narrower make. Members were agreed that in sandy country this was undoubtedly the case, but were not of this opinion in regard to boggy or clayey land, as once the tire got through the upper crust it was a very difficult matter to pull it out again.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Coonalpyn, November 26.

(Average annual rainfall, 17½ in.)

PRESENT.—Messrs. Masters (chair), Fidge, Bone, Liersch, Masters, jun., and Venning (Hon. Sec.).

TAKEALL.—Mr. Fidge read an extract on the question of takeall. On his own farm the crops on some kinds of soil were affected more than others, the limestone ground being the worst. Mr. Venning had found crops grown on early fallow to be affected by the disease more than those on land fallowed at seeding time. Mr. Bone was of opinion that the trouble was caused by poverty of soil. Others disagreed with this, but could offer no other explanation,

TIME OF SEEDING.—Mr. Bone wished to know whether members had reaped larger returns from early or late sown wheats. His experience had been that the best crops resulted from July sowing. Mr. Fidge preferred to sow from about the middle of May to the second week in June, while Mr. Masters would seed any time in May and early in June.

ALGERIAN OATS.—A splendid sample of Algerian oats was tabled by Mr. Bone. Most members thought the sample in the right stage to cut for hay, but Mr. Masters preferred to see more grain before cutting.

Forster, November 20.

(Average annual rainfall, 10½ in.)

PRESENT.—Messrs. Jas. Searle (chair), Haymen, Luscom, W. Searle, H. and W. E. Towill.

POULTRY FOR THE FARM.—Mr. Towill read a paper on this subject to the following effect:—"It was sometimes thought that poultry-keeping paid because the fowls ate up screenings and waste wheat, and were very little trouble. It really was doubtful whether, under these conditions, they did pay, as it was necessary to do more than throw out some wheat twice a day and provide a supply of water. It was necessary to procure at the outset healthy birds of a good laying strain, and to be sure of this buyers would be wise to select the birds themselves. It would be cheaper, in the end, to give £2 for a tip-top bird than 5s. for a poor one. For breeding purposes the most attractive birds in the yard should be selected, and the cock should not have too large wattles in comparison with the comb. Just before the hatching season a dozen or more of the best laying hens should be put in a separate yard with the best cock available. For setting the hens later a yard, enclosed on three sides and the roof, and with a wire netting front, was the best kind of place. The nests should be on the ground covered with a box from which part of the side was removed. Newly-hatched chicks should be removed to another yard until strong enough to run with the other fowls. Drinking water should be kept in the shade, and the vessels containing it should be kept quite clean. Warm quarters for roosting were necessary, and should also be kept very clean. The feeding needed some thought and care. He would give the morning meal the first thing each day. Boiled wheat, while still warm, was a good feed for a change, and milk, when two days old, could be given, but it should be put in a shady place." In the discussion which followed, Mr. W. Searle thought an open yard the best for hatching hens, and advocated a change of poultry every few years.

Parrakie, December 5.

PRESENT.—Messrs. Dayman (chair), Beelitz, Schmidt, Ferne, Short, Bottroff, O. and C. Heinzel Diener, Neindorf, Willis, Gravestock, Burton (Hon. Sec.), and six visitors.

DRAKE.—Discussion took place concerning the prevalence of this weed. It was found in crops grown on new land from clean seed. Some members thought the seed was brought by sheep, but most of those present were agreed that it was introduced in the seed wheat.

BOTTFLY.—Mr. Schmidt wished to know the best means of protecting horses from bottflies. It was stated that carbolic oil had been found to keep the fly away.

Rhine Villa, November 26.

(Average annual rainfall, 10½ in.)

PRESENT.—Messrs. G. A. Payne (chair), Hayden, Hecker, F. Payne, and Vigar (Hon. Sec.).

CO-OPERATION IN HARVESTING.—Mr. Hecker read a paper on this subject to the following effect:—"There were many advantages to be gained in co-operative harvesting. One man's crop might be fit to harvest a week before that of his neighbor, and by working together this might be in the bags by the time the next man's crop was ripe. Many hands working on the same crop resulted in more work with less drag and monotony than was the case where each farmer worked on his own account. If four farmers agreed to supply two strippers each and bought a motor winnower jointly they could fairly expect to average eight acres a day each machine—or 64 acres for the day's work. If each man had 300 acres to strip it would take, say, 19 days to get the crop off. Five men could do the winnowing. By harvesting in this way the cocky chaff would be saved and seeds

of weeds would not be blown all over the paddocks as was the case with the harvester. Less skilled labor was required in handling strippers, less expense entailed, and the life of the machine was much longer than that of the harvester." In the discussion which followed the general opinion expressed was that it was best for each farmer to do his own work when and as he pleased. Co-operation amongst farmers in this matter was considered to be impracticable and unadvisable.

Waikerie, November 22.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Burroughs (chair), Rogers, Burton, Lewis, sen. and jun., Jones, Modestock, Baum, and Green (Hon. Sec.).

BREAKWINDS.—The question of timber for breakwinds was discussed. Mr. Burroughs thought in view of the wholesale destruction of native timber a clause should be inserted in all Crown leases stipulating that a strip of timber at least a chain wide should be left on the side from which came the prevailing winds. Mr. Jones agreed that this would be a wise course where the growth was suitable, but timber like whip-stick mallee was not worth having. The worst feature of cutting out the native timber was that other trees could not be grown without being watered. Mr. Burton did not believe in allowing timber to stand as a breakwind, as the result in many districts was the formation of sandhills and a harbor for rabbits.

SMUT IN WHEAT.—Members wished to have the following questions regarding bunt (smut) answered through the *Journal*:—1. The cause? 2. The best preventive? 3. Why are selfsown crops less liable to the disease than others? [The answers to Nos. 1 and 2 are fully given in another part of this issue—see article on "Bunt." In regard to selfsown crops conditions sometimes favor germination of the spores before the wheat itself germinates; consequently, after germinating the fungus dies.—ED.]

SOUTH AND HILLS DISTRICT.

Cherry Gardens, November 23.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Stone (chair), Jacobs, C. and I. Ricks, Lewis, Hicks, Chapman, Broadbent, Kayser, Brumby, Curnow (Hon. Sec.), and one visitor.

WATTLE GROWING AND STRIPPING.—Mr. A. Stone read a paper on this subject. If possible he would gather the seed from good trees in preference to buying it from a seedsman. The trees from which to gather seed should have thick "ringy" bark. In this district it was difficult to grow wattles in clear grass paddocks, as the cattle and sheep ate the young foliage, but if there was a good supply of scrub or bush in the paddocks the wattles would be very little troubled. He would not strip young trees while growing vigorously unless the crop was too thick. In the latter case it was advisable to thin them out. A thin scattering of timber trees to protect the wattles from rough winds helped them along materially, but if growing in thick timber the wattle bark would have a "poor lining." The simplest way to strip the bark was to cut the wattle down, trim off the foliage to the small limbs, then cut the limbs off. The bark was removed by tapping on a piece of wood of convenient height and shape. He put the bark up in bundles about 3ft. to 4ft. long, and of sufficient girth to weigh about $\frac{1}{2}$ cwt. when dry. It was best not to tie the bundles up until dry. Mr. Curnow asked whether it did not pay to strip the lower part of the wattle before it was cut down. He thought the thickest part of the bark was around the earth line, and he had noticed that in many cases the roots would strip for some considerable distance, thus increasing the yield of bark. Mr. Stone said that where the soil was of a sandy nature it was an advantage to strip in that way, but where the ground was hard he preferred to cut the tree down level with the ground before stripping. Mr. T. Jacobs strongly advocated cutting down and tapping. It saved a lot of pulling and jerking, and where the trees were running badly saved a lot of time. He thought frost did more to

check the growth of the wattle than did the stock. Mr. Jacobs did not think the bark should be tied up green. Care should be taken to see that it was dry right through the bundle; otherwise the bark would become mouldy and depreciate in value. He always cut the wattles the desired length before removing the bark. In answer to a question Mr. Stone said that he poured boiling water over the seed before sowing.

Dingabledinga, December 8.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. Trumper (chair), Felix and F. DeCaux, Allen, Gill and Chenoweth (Hon. Sec.).

POTATO-GROWING.—The Hon. Secretary read a paper on this subject. This was an industry which called for a lot of time and attention. In this district, with its heavy rainfall, careful preparation of the soil was necessary. It should be ploughed in spring and left to the sweetening action of the sun. A few seed might be planted for early potatoes as soon as horses could be taken on to the land, but for the bulk of the crop it was far better to work down the soil first so as to retain as much moisture as possible in the hot months. Rotation of crops, he thought, would in the future help the potato-growing of this district. He would sow a crop of peas, then fallow in summer and plant an early crop to plough in as green manure. He also advocated applying 3ewts. of sulphate of potash to the acre. The best kind of potato to plant was hard to decide, as there were many good varieties. Some matured very quickly, while others would withstand a little drought in summer, provided there were autumn rains. He had found that potatoes grown with the least quantity of moisture would keep longer than those grown with plenty. For the hillside Bismarck's, Carmen's No. 1, Up-to-Date, and Avoca were amongst the leading varieties, and they matured very quickly. The potato that he had obtained the best results from was the Snowflake. This variety when planted in November would grow all the summer, and produce a good crop after the first rains. Other varieties for late planting were the Brown River, Prolifice, and Mount Gambier Redskin. In the discussion which followed Mr. F. DeCaux considered it did not pay to grow potatoes for market in this district. He had seen them growing here for 30 years past, but seldom a profitable crop. Mr. Felix DeCaux thought that if it paid to grow them for household use it would pay to grow for market. He thought insufficient attention was paid to the business. He wished to know how to select seed and how to keep it. The Hon. Secretary thought the best way was to keep all the tubers from the plants that yielded the best crops. The way to keep seed potatoes was to place them on wire-netting trays with plenty of light and to protect them from the rain.

Golden Grove, November 25.

PRESENT.—Messrs. Robertson (chair), Maxwell, Milne, Angove, Tilley, and Harper (Hon. Sec.).

OIL ENGINES.—Mr. Tilley read a paper dealing with oil engines. He considered that farmers could not afford to do work incidental to their calling by horse power if it could be done by an oil engine. With a $9\frac{1}{2}$ B.H.P. engine and a No. 4 cutter, 2 tons of chaff could be cut up in an hour, requiring two men for the work, and consuming sixpence worth of kerosene and lubricating oil. In two hours, with such an engine, 6 tons of firewood could be cut into foot lengths at a cost of two men's time and 1s. for kerosene. He sometimes cut chaff and fairly light wood at the same time. When this was done one man could manage the saw. For ordinary farm use he recommended a $7\frac{1}{2}$ B.H.P. engine. This would drive a No. 5 cutter and elevator, a 28in. circular saw, or would lift water 200ft. at the rate of 3,010galls. per hour by means of a 4in. double pump. A comparison of the various types followed, including the use of one and two fly wheels. In his opinion the oil engine was to be preferred to the petrol engine as being much more durable and far less liable to cause fire. In the discussion which followed members were of opinion that the limited amount of work which could be done by this means in this neighborhood was not sufficient to warrant the initial outlay required for this class of engine.

Kanmantoo, December 3.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. A. D. Hair (chair), W. G. Mills, Downing, Lewis, Lehmann, W. Champion Mills (Hon. Sec.), and two visitors.

TAKEALL.—Discussion took place on the question of takeall in wheat. Members agreed that growing peas or oats checked the takeall, but the same could not be said of barley. Mr. Lehmann was of opinion that the disease, germ, or spore was carried from one place to another in the seed. He quoted an instance in which seed was taken from an infected crop and sown where takeall was unknown, and the subsequent crop was badly affected.

Kingscote, December 6.

(Average annual rainfall, 18½in.)

PRESENT.—Messrs. Turner (chair), Bell, Mitchell, Jacka, Nash, Wallace, Campbell, Wright, Cook (Hon. Sec.), and several visitors.

HAYMAKING.—Mr. Bell read a paper on haymaking. Judging from experience extending over half a century, he was of opinion that the quality of the more recent crops was not equal to that of former years. This difference had been attributed by some to the use of superphosphates, but he had doubted that in the past. However, there was something wrong with a great deal of hay now grown. Although the appearance was good, horses and cattle subsisting on it lost flesh as soon as they were worked. Cutting the hay with the binder he thought was partly responsible. The hay being cut, bound, and stooked in one day gave little chance for the sun to turn the sap into sugar. A further factor, he considered, to be the growing of varieties of wheat or oats which were unsuitable for hay, such as Algerian oats and certain rust-proof wheats. Cape oats were seldom grown in this district now, and the Algerian substitute became bitter if cut green, while horses would not eat it if left until nearly ripe. Indian Runner wheat was of little value as horse-feed. There was practically no sugar in the straw, and the same might be said of the rust-proof wheats. He would rather have one ton of good Cape oat or White Tuscan hay than a ton and a half of any other. A good discussion followed. The Hon. Secretary and Mr. Campbell were of opinion that the responsibility for the inferior hay lay with the farmer rather than the binder or fertilisers. The Chairman also thought the manure had nothing to do with the poor quality, but believed the trouble was caused by trying to grow quantity rather than quality, and also in planting unsuitable wheats. White Tuscan was considered by some to be the best wheat for hay, while others thought Chevalier barley was preferred by cattle to wheaten or oaten hay. It was mentioned that a great deal of stripped straw had been cut up for chaff, and this accounted for the poor samples which had been sold. Samples of Alpha wheat grown from West Australian seed and of barley, oats, and wheat grown on the hilly part of the ironstone country were tabled. These last were said to be the best samples seen of crops grown on that soil. Well-grown rape from the same part was also exhibited.

NITRO-BACTERINE.—Mr. Campbell quoted an instance of the successful application of nitro-bacterine in West Australia, and it was decided to ask for fuller information through the *Journal*. [At present there is very little reliable information concerning the use of nitrogen bacteria in this State. Several different preparations of nitrogen bacteria have been tested here, but results have been usually of a negative character. We are not, therefore, in a position to say whether this "nitro-bacterine" will do all that is claimed for it; carefully conducted experiments conducted for several years by trained observers will be required to settle this question.—ED.]

Port Elliot, November 20.

(Average annual rainfall, 20½in.)

PRESENT.—Messrs. Welch (chair), Brown, Pannel, Green, Vince, W. E. and W. W. Har-greaves (Hon. Sec.).

POTATO BLIGHT.—Mr. Vince, in an address on potato-growing, said that he had pickled seed potatoes affected with the Irish blight in a solution of bluestone and water. After treatment the tubers were put in the sun and left for two or three weeks. Up to the present there were no signs of the blight in the plants grown from these seed. Magnum Bonum potatoes were said to be the best for this district, and it was considered best to plant 12in. apart, with 2ft. between the rows. A visit was afterwards paid to the garden where these potatoes were growing.

CATERPILLARS.—It was reported that caterpillars were very prevalent this season in the district.

CASTRATION OF COLTS.—In reply to a question it was stated that the best age to castrate a colt was from 10 months to 12 months old. Mr. Vince had performed the operation on a horse 27 years old with satisfactory results.

MAGPIES.—Members wished to know how to prevent magpies from eating young chickens, destroying crops of strawberries, wheat, oats, pears, maize, &c., when coming up. [Can members of other Branches say to what extent magpies do damage of this sort in other districts? —Ed.].

SOUTH-EAST DISTRICT.

Kalangadoo, December 11.

PRESENT.—Messrs. Tucker (chair), Boyce, Gibb, Tucker, Vorwerk, Osborne, Hunt, Earle, Ellison, Rake, and Sudholz (Hon. Sec.).

PLoughing.—Mr. Earle read a paper on this subject as follows:—"In this district summer ploughing is very beneficial; the more the soil can be exposed to the sun the better. A farmer who intends to plough in the summer should commence as soon as possible after harvesting operations are over. The disc plough is the best for summer use, as it will enter the ground better than the set plough and leaves the soil more open to the sun. The depth may vary according to the nature of the soil; 4½in. is a good depth here. I do not favor the practice of ploughing round the paddock year after year, as the soil is being removed from the centre and lodged on the outside of the paddock. For instance, ploughing 5in. deep three years running the land would be 15in. higher on the outside than in the centre. It would be better to plough in strips of two or three chains wide and the next ploughing it could be turned back again. As soon as the first rains set in the ploughing should be harrowed or scarified. If the land is free from weeds it may be sown as it is; otherwise it should be ploughed again with a set plough not deeper than 3in. to 3½in. The disc plough should never be used after the rains set in, as it is a summer implement as far as this district goes. I do not favor deep ploughing in the winter, but consider 3in. to 4in. quite sufficient. Deep ploughing here is only turning the best soil down and bringing up the cold soil for the grain to grow in, apart from the extra work for the horses. I prefer the short mouldboards to the long ones, as they pulverise the soil better and are much lighter in draught. An 8in. or 9in. furrow is a good width to plough. Every ploughman should endeavor to plough as straight as possible, as crooked ploughing causes a lot of bother at the finish, and a bad finish means a bad start the next year. The land should be not less than a chain wide, or, better still, a chain and a half. The crown should not be higher than the other ploughing. The surface of the land should be as even and level as possible. Bad ploughing not only means trouble for the one who is cutting, but a loss to the owner if cutting for hay. Spring is the best season of the year for ploughing to improve the land and clean it. All plants and weeds are in a forward condition, and if well ploughed under form good manure. Potatoes or rape may be sown, and when dry or eaten off the land will be in good condition for the next crop. In the spring I prefer flat ploughing, as the weeds are not then so likely to grow as they are with the narrow furrows. This paper applies only to this district or any other of a similar character." In the discussion which followed members agreed that the disc plough used in summer was the best implement to kill sorrel.

WOOL.—Mr. Gibb tabled specimens of wool from crossbreds between Romney Marsh and Merino, and also Lincoln-Merino crosses. The Lincoln-Merino fleeces from two-tooths weighed ½lb. heavier. Specimens of wool were also tabled by Mr. Tucker, there being pure Lincoln and also three-quarter bred Lincoln; the pure wool was quite 3in. longer than the three-quarter bred. Discussion followed, members favoring the Lincoln-Merino fleece.

BARLEY.—Mr. Tucker tabled a sample of Golden Drop barley which is recommended as a good malting variety.

Keith, December 1.

PRESENT.—Messrs. Shackely (chair), Usher, Tyner, Schultz, Williams, Goodhand, S. E. and P. Crouch, Makin, Dall, Draper (Hon. Sec.), and four visitors.

PIG-RAISING.—Mr. Dall read a paper on this subject. He considered that farmers as a rule did not pay due attention to keeping this class of animal. If properly kept they would pay well. Pigs were said to be dirty animals, but often the owner was entirely responsible for their being in a dirty condition. Every pigsty should have a yard attached to it, and, if possible, small paddocks for grazing should be provided. Rye, barley, and other crops could be grown for them in winter, and a small crop of lucerne for summer was of very great value. If young pigs were taken from the sows when about seven weeks old and fed for about three weeks, they would then do very well on grass. In this way a farmer was able to raise a large store pig at the same cost as a sucker. A pig raised in this way would require very little fattening—about three weeks on hard food would fit him for the market. Peas could be fed to the pigs raw, but oats, wheat, or barley should be crushed, soaked, or boiled. For porkers he would recommend the Essex breed or an Essex-Berkshire cross. For bacon a higher and longer class of pig was best, such as the Tamworth, Yorkshire, or Poland China. His experience had been that almost any cross-bred animal would do better than a pure-bred, and would fatten more quickly. Pigs should be provided with suitable quarters in winter, as they felt the cold much more than many people supposed. A warm sty and plenty of bedding would save corn. A cool place was necessary in summer, and for this he would recommend an open shed with a roof of straw. A shallow bath of water in the yard was also to be advocated, and the pigs would gladly avail themselves of the means so provided to get a cool bath. If it was necessary to keep the pigs closed in, the sty should be as open as possible in summer. A brick floor was much better than one made of earth. He considered that at any time it would pay better to feed pigs on oats than to sell the latter at 1s. per bushel. Mr. Schultz had made pig-raising pay. He grew peas and cut them while green for feed. When the peas died off he turned the pigs on to them to feed themselves. The Chairman considered it very wise to grow peas for pigs on account of the consequent enriching of the soil in nitrogen, in addition to the excellent fodder provided. In reply to a question Mr. Dall said the best fence for a pig paddock was made with wire netting.

HARVEST PROSPECTS.—The general opinion of members was that the yields this season would be slightly better than those of last year. There were no blighted heads, and the grain was of a better quality.

WHEAT FOR THE DISTRICT.—It was considered that Marshall's No. 3, Yandilla King, Clubhead, and Federation were the best wheats for the district. [Members of this Branch would be glad to learn of members of other Branches who can supply Clubhead seed wheat.—ED.]

Mount Gambier, December 11.

(Average annual rainfall, 31½ in.)

PRESENT.—Messrs. Sassanowsky (chair), Holding, Pritchard, Ruwoldt, Mitchell, Dow, Bodey, Major, Kennedy, Cobblewick, Niquet, Smith, Keegan, Sutton, Wedd, Edwards, G. and D. Collins (Hon. Sec.).

AGRICULTURE IN THE SOUTH-EAST.—At the commencement of this meeting the Chairman introduced Mr. W. J. Colebatch, B.Sc., M.R.C.V.S., in whose charge the Kybybolite Experimental Farm has been placed, and who will have charge of experimental and general agriculture in the South-East. Mr. Colebatch briefly outlined the principles upon which he proposed to proceed. He wanted to make arrangements with farmers whereby they would guarantee to the department the use of certain blocks of land for at least five years to enable experiments to be carried out for sufficient time to ensure accuracy. In return for the land the owner would have the crop, with a small reservation for a sample, for which the department would pay the market price. The landowner would also have this great advantage, which could not be compensated for by money: the experiments would be on his own block of land. When the variability of land was considered that was of much importance. This experimental work might cost some money, but the knowledge gained would be well worth while. They had a lot of bracken sandy country lying up above Kybybolite. They told him there was 14 miles of such scrub lying westward of the railway line which was not carrying a hoof. He proposed experimenting with eight or ten acres of that land. If he could secure it he would raise blue or yellow lupins, preferably yellow; and if not them he should take something else. He would prefer to grow lupins, and plough the crop in each year. If at the end of the first year he ploughed lupins in he should crop the land. He would probably not get much of a result that year, but next year he would do the same, and so on each year until he had four, five, or six years' crops ploughed in, and fermenting each year. In that way he believed

he would eventually get the soil sufficiently loamy to grow fair crops, and perhaps some day it would be so altered in character as to produce a good crop of potatoes. With the rainfall they had here he was thinking they might do a good deal with that light land. They had land in New Zealand not a bit better than this bracken land, and 23in. of rainfall, and on that land they were growing crops of feeding turnips. They were not large turnips, but they were strong feed, and this was the class of country on which some of the best mutton and lamb was produced to-day. At Mr. Colebatch's request a committee was appointed to assist him in arranging experimental work for this part of the district.

Penola, November 13.

(Average annual rainfall, 26 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Strong (chair), McDonald, McKay, Pinches, Ockley, Darwent, Fullerton, Alexander, Robinson, McBain, Ricketts, Warner, Richardson, and Adamson (Hon. Sec.).

DRAKE IN CERAL CROPS.—Mr. McKay spoke of the exceptionally large quantity of this weed seen in the crops of this district. Messrs. McBain and Richardson were of opinion that the seed of this plant would not germinate to any extent in seasons less wet than the last. Mr. Pinches had wheat growing alongside oats. The seed put in was clean and the land new, but the wheat crop contained nearly half drake, while the oats were free from it. Mr. Ricketts considered the trouble was largely caused by feeding horses on dirty chaff. Some members considered drake to be good horse feed.

Penola, December 11.

(Average annual rainfall, 26 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Strong (chair), McDonald, Maxwell, Warner, Ockley, Wilson, Peake, Darwent, Alexander, Pinches, Miller, Richardson, and Adamson (Hon. Sec.).

KYBYBOLITE EXPERIMENTAL FARM.—Discussion concerning the visit paid recently by local farmers to the Government Farm at Kybybolite took place. Mr. Ockley thought it would be an advantage if small pamphlets describing the manner in which the separate fields and plots were treated were supplied to visiting farmers, as it was difficult for all visitors to be with the farm manager at the same time. Mr. Adamson thought the department should publish the results of all experimental work at Kybybolite. Mr. Darwent was of opinion that the farm was unsuited for the work owing to the boggy nature of the soil. Mr. Alexander referred to the purchase by the Government of a Mole drain plough, and suggested that it might be successful in the South-East, in which case it would be a great boon. Members gained much valuable information regarding poultry from the expert while on this visit. [The Kybybolite Government Farm is an *experimental* farm, and is situated on soil which is characteristic of a very large area of the surrounding country with the object of finding out what can be done with this land.—Ed.]

AGRICULTURAL PUBLICATIONS

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

Pruning of Fruit Trees, by G. Quinn, 1s.; posted, 1s. 6d.

Vinegrowers' Manual, by A. Sutherland, 6d.; posted, 7d.

Reports of Conferences of Australasian Fruitgrowers held at Brisbane and Wellington, 1s. each, or 1s. 3d. if posted.

Journal of Department of Agriculture of South Australia, 1s. per annum, in advance; 3d. per copy.

Any of the following Bulletins and Leaflets may be obtained by sending a penny stamp for postage:—

Agricultural Miscellaneous: Milling Characteristics of Australian Wheats; Semi-arid America—Its Climate Compared with that of South Australia; Agricultural College, Roseworthy—Harvest Reports; Agricultural College, Roseworthy—Reports on Permanent Experiment Field; Rust-resistant Wheats; Reports on Agricultural Experiments; Noxious Weeds; The South Australian Wheat Yield, Season 1907-8; Improvement of Cereals; Dry-farming in America; Congress Reports; Lucerne Hay; House-building in New Districts; The Amount of Spirit which can be Extracted from a Ton of Raisins; Irish Potato Blight—An Enquiry into South Australian Conditions.

Chemistry and Soils: Soil Surveys; Available Plant Food in Soil; Reclamation of Land.

Horticulture: Select List of Fruit Trees; Preserving, Canning, and Drying Fruits; The Lemon in Sicily; Notes on the Olive; Defects in Export Apples; Apple Mussel Scale; Some Notes on Almonds; When to Apply Bordeaux Mixture; Fruit Flies; Fruit Maggot-fly Pests; The Codlin Moth; Fruit-drying for Beginners; Fruit-drying in California; Gumming Disease of Peach Tree; Banded Pumpkin Beetle; Bordeaux Mixture and other Fungicides.

Stock: Suggestions to Inquirers *re* Stock Complaints; Influenza and Strangies in Horses; Stomach and Bowel Disorders of the Horse; Pig-breeding and Bacon-curing; The Branding of Stock; Preparation of Small Clips for Market.

Poultry.

Dairying: Taints and Flavors in Dairy Produce; Milking of Cows; List of Dairy Factories; Instructions for Milk and Cream Suppliers; Spaying of Cows.

THE JOURNAL

OF THE

Department of Agriculture OF SOUTH AUSTRALIA.

No. 7.

FEBRUARY, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Australian Wheat Standards.

The weight of the standard bushel of wheat for the season 1909-10 has now been fixed in all the States, as follows :—South Australia, 62½lbs. ; Victoria, 62½lbs. ; New South Wales, 62lbs. ; Western Australia, 62lbs. There has been no alteration of the previous year's weights except in the case of New South Wales, where there is an increase of half a pound. In the averages of the weights for the last 12 years, South Australia continues to occupy the premier position, the difference between the averages for Victoria and this State being ½lb. A considerable quantity of wheat has been shipped from South Australian ports this season to South Africa under the Government guarantee that the cargo is f.a.q., and the fact that no wheat has failed to pass the examining officers goes to show that the standard has not been fixed too high. On the other hand there have been no public complaints that it has been fixed too low.

Opening of the Fruit Export Season.

By the end of the present month shippers will be busy packing and forwarding their surplus fruit to oversea markets. Judging by general reports there promises to be a large supply of apples, but the quantity of pears available for shipment will not reach last year's figures, viz., 8,733 cases. Already two shipments of apples have been made to Indian ports and one to London. The latter went forward in the s.s. *Orvieto* on January 27th, and shippers will be anxiously awaiting news concerning the condition of her fruit upon arrival. Her consignment comprised 303 cases of pears (almost all being of the Duchess variety), 47 cases Gravenstein apples, and five cases of Wickson plums. Should success crown the enterprise, this shipment will prove the forerunner of a large export trade in Duchess pears. The first of the regular London shipments will be made on the 25th instant. The department was besieged with applicants for space, especially on the early boats; but, owing to the limited allotments made by shipping companies, only about one-half could be arranged for. The best evidence of the satisfaction of the growers is the fact that many of them send the whole of their crop for sale by the Trades Commissioner in London. During this season it is intended to ship at least one consignment direct to Avonmouth, and in all probability another shipment will go to Paris. Hamburg and other ports are also to receive

attention. The Acting Trades Commissioner reports that there is every indication of favorable markets being met with, both in London and Hamburg, always providing fruit is up to standard and that care is taken to see that only those varieties suitable to the different markets are sent.

Agricultural Statistics.

The forms which all producers are required to fill up annually for the purposes of the Statistical Department are now being distributed throughout the State. Those who occupy holdings of one acre and upwards must fill up the forms, and they are asked to assist the collectors by supplying correct information promptly. Farmers and others are informed that all information given is used for statistical purposes only, the aggregates for each district alone being published. Under no circumstances whatever is the Taxation or any other department allowed access to the returns. It should be borne in mind that it is by the statistics compiled from the farmers' returns that the progress and prosperity of the State are judged, and in a record year like the present one it would be regrettable if the results were understated.

Fruit Tree Pruning.

A valuable textbook on fruit tree pruning, compiled by Mr. G. Quinn, the Government Horticultural Instructor, has recently been published by direction of the Minister of Agriculture. The former editions of Mr. Quinn's work on pruning, published in 1900 and 1901, have long since been exhausted, and the demand which they met will no doubt be again experienced by the larger and better book which is now to be obtained from booksellers at the moderate price of 1s. 3d., or 1s. 6d. including postage. Mr. Quinn's latest book is a distinct improvement on what he describes as the two previous editions of it. The information previously published has been revised in the light of recent experience, many fresh illustrations have been introduced, and a good system of classification of the chapters adopted, the whole forming a well-printed volume of 230 pages. A prominent feature of the book is the number of illustrations, many of which are new. Many a person who has attended lectures or made a study of pruning when placed in front of a tree has found himself at a loss how to prune it properly; and it is to such a man, as well as to beginners, that the graphic illustrations in Mr. Quinn's book of how to prune will be of special value. The book is complete in every particular, and is a credit to the knowledge and industry of Mr. Quinn.

Government Seed Wheat.

A correspondent to the daily press has suggested that the wheat yield of South Australia might be improved if the Government arranged to provide seed wheat for farmers, and he has proposed that the Government should obtain a farm of 500 or 600 acres for the purpose of growing the necessary quantity. Presumably this means a farm in each district, for the total quantity of wheat used for seed in South Australia nowadays is roughly 2,000,000 bush. The Minister of Agriculture has pointed out that wheat grown at Roseworthy and Parafield is sown from seed and is thoroughly graded and true to type. As larger areas are brought under cultivation at the various experimental farms greater quantities will be available for farmers, and this will be the case particularly at Veitch's Well, in the Loxton district, and in the hundred of Shannon, Eyre's Peninsula. The wheats grown at Parafield this year have been practically all commandeered for seeding purposes at Parafield, Loxton, Veitch's Well, and the hundred of Shannon. Between 100 and 150 acres will be planted at Parafield during the coming season with selected seed, and about 100 acres of new land will be similarly dealt with in the hundred of Shannon. At Loxton this year the department has about 400 bags of good clean seed for distribution, the original seed having come from Parafield Station. Almost every bag of wheat produced at Loxton last year was distributed amongst the farmers. This year new seed will be supplied from Parafield to the farm at Loxton, where about 200 acres will be sown, and also to the farm at Veitch's Well, 18 miles south of Loxton, where it is proposed to plant about 350 or 400 acres. A special effort will be made at those centres in the direction of supplying seed specially suitable to the locality as determined by the farm experiments in each district. In future nothing but crossbred wheats and the first year's selection of clean seed will be grown at Parafield.

Export of Duchess or Bartlett Pears.

A little over 12 months ago the committee of the South Australian Fruit-growers' Association made arrangements for a shipment of the well-known Duchess (or, as it is known in other parts, the Williams' Bon Chretien or Bartlett) pears to test the London market. This pear has been kept in cool storage in all parts of the world for periods up to four months, and there should be no difficulty in landing it in London in good order. London dealers advise that profitable prices are almost certain during March for good quality pears. Owing to lack of support from the growers the proposal fell through, but this season the Secretary to the Fruitgrowers' Association (Mr. W. L. Summers) took the matter up again, with the result that the s.s. *Orvieto*, which sailed on January 27th, carried about 250 cases of these pears. In addition, 50 to 60 cases of Durondeau and Gansell Bergamot pears and 50 cases of

early apples have been sent by the same steamer. The Western Australian Fruitgrowers' Association has been co-operating with the local association, and about 110 cases were shipped at Fremantle. This experiment is of great importance to the southern States, as if we can find a market for a few thousand cases each week during March and April it will lead to an extension of the area under pears and to improved prices, as at present the demand for this fruit for drying and canning is not sufficient to ensure profitable prices to growers. The season for this pear as fresh fruit could be considerably extended by the utilisation of cold storage, but our growers do not appear to realise the value of this for local markets. In Victoria and Western Australia large quantities of peaches, pears, and other soft fruits are stored in cool chambers for several weeks.

Clean Wheat.

A paragraph which recently appeared in the *Corn Trade Journal* is of interest as bearing on the recent investigations of the Wheat Commission. It says—"The value of absolutely clean wheat is fully appreciated by every thinking miller, as on this the entire work of the mill depends, and if the wheat is not thoroughly clean all the other work goes for nought, as it is impossible to make a high-grade flour from wheat which is not of itself high grade in the essential of cleanliness. When wheat covered with dirt or drift once reaches the rollers there is no process known to modern millers of eliminating the impurities, nor is there any way to make flour of as high a grade as is demanded by the extremely critical dealer or consumer of to-day. The demand is for high-grade flour all the time, which means flour of a good color, free from specks of any sort, and which has strength." If it is judged only by the weight of the standard bushel, which is generally regarded as the best indication of quality, South Australian wheat will rank as the best produced in Australia, and it enjoys a good reputation for cleanliness, and commands next to the highest price in the London market. What the Wheat Commission endeavored to ascertain was whether a better price commensurate with the cost of double handling might not be secured for it if the impurities now bagged with the wheat were removed prior to shipment. Professor Angus, in giving evidence before the Commission stated that 15,000 tons of rubbish are bagged up with our wheat in a 20,000,000 bush. harvest, and the inference was that the reputation of South Australian wheat would be improved and a better price obtained if that rubbish could be removed before the wheat reached the miller. The problem is one that can be solved more easily by Australian wheat merchants and millers than by the farmers, because in the rush of the harvest the double cleaning would be a big undertaking for the latter, and many of them would only carry out the extra work if the recompense

were substantial. If the recommendation of the Wheat Commission, that parcels of wheat above the f.a.q. standard be forwarded to Europe for experimental market purposes, were given effect to the result would probably show the Australian farmers and wheat merchants to what extent financially "absolutely clean wheat" is appreciated by the English miller, and then calculations could be made as to whether the better price received would more than pay for the extra cleaning.

Summer Pruning.

The Horticultural Instructor (Mr. G. Quinn) writes—"No time should be lost now in thinning out the dense shoots of the peach tree, so that the remainder of the summer's sunlight may penetrate through the head of the tree to mature the buds and shoots for next season's crop. In most cases where the leader was cut last winter four or five strong shoots have emerged. These should be thinned out, leaving one or two, according to the space available, while the strong, rank growths in the middle of the tree should either be shortened or suppressed in accordance with whether they are required for filling bare spaces or not. These remarks apply to the apricot as well as to the peach. Those varieties of fruits—such as apple, pear, and European plum—which carry their fruit upon permanent spurs often require attention just about this time of the year. The thinning out of superfluous shoots which tend to fill the centre of the tree, as well as the surplus leaders which started from the top of last year's wood, is very necessary; but it is desirable to retain a fringe of those laterals which project outwardly from the main arms and which hang like an apron round the outer face of the tree. The laterals which are removed to admit light and air may be shortened back within 4in. or 5in. of their bases. The main advantage to be obtained from this work is the admission of sunlight to those spurs which are forming naturally from the leaders or laterals, thus enabling them to ripen slowly and steadily. The transforming of the buds upon the stub of the lateral which has been shortened is usually a very gradual process, and although it certainly does take place during the course of two or more seasons it is not, after all, the main consideration of summer pruning. Though the laterals which have been allowed to hang as a fringe on the outer surface of the main branches are somewhat untidy in appearance, they will tend to check off the vigor of a tree which has assumed a fair size, and as the fruit spurs upon such laterals become of value in the course of a season or two the lateral may be shortened back closer towards the parent limb, so that when laden with fruit it may not bend down and overlap its fellows to an injurious degree."

Bitter or Brown Pit of Apples.

The Secretary to the South Australian Fruitgrowers' Association writes as under—"At the National Conference of Fruitgrowers held in Perth recently the question of losses caused to the fruit industry by the disease known as bitter or brown pit was discussed at some length, and it was decided to ask each State Government to appoint a committee consisting of two apple-growers and a departmental expert to inquire into and report fully on this trouble. It was further resolved that one of the delegates from each State should endeavor in the meantime to obtain from growers, for the benefit of the proposed committee, such information as may be available, and I was deputed to undertake this work in South Australia. In view of the heavy losses every season from this disease the matter is one of practically national importance, and I would therefore ask you to be good enough to give publicity in your rural columns to the inquiry we have undertaken. Information is desired on the following points :—How long has the disease existed in the orchard ? Are any varieties more subject to it than any other ? Is there any class of soil or are the trees on any kind of stock more subject to it than any other ? Have any experiments, including manures, been tried, and, if so, with what results ? Under what weather conditions—*i.e.*, the season generally—is the disease most prevalent ? I shall be glad if fruitgrowers will give this matter attention and communicate with me.—I am, &c., W. L. SUMMERS, Coromandel Valley."

Destruction of Saltbush by Insects.

Mr. W. W. Froggatt (the Government Entomologist of New South Wales) recently examined a large tract of country in the neighborhood of Hay, where it was reported that the saltbush had been destroyed by insects. There are some hundreds of thousands of acres upon which the whole of the saltbush has been completely denuded of its leaves, and in many cases, particularly on the higher land, the plants are dead. Mr. Froggatt was informed that some months ago the whole of this country was swarming with caterpillars which cleared the leaves off the bushes. He found in the soil under the bushes a great number of pupæ of two different moths that had done the damage, and secured a large number to breed out so that the species can be identified. The denuded saltbush was later on attacked by the larvæ of a beetle or weevil, and an immense number contain the larvæ or pupæ which are the final cause of much of the saltbush dying. In many places a web-spinning spider has become so numerous on the plains that every dead bush is covered with fine web, so that in the early morning, or when the sun is low, the miles of web-covered bush has a most remarkable appearance. While there is a great deal of the bush quite dead, some of the plants which have been attacked by caterpillars only are showing signs of life, and if summer rains come in good time

they will probably recover. In the meantime, some hundreds of thousands or acres are apparently covered with dead twigs, and an immense amount of valuable stand-by fodder has been destroyed. Mr. Froggatt regrets to add that nothing can be done as regards dealing with these pests on such a large area, but from observations made he is of opinion that on the plains a large proportion of the moth pupæ are infested with an ichneumon wasp, many of which were flying around while he was digging out the pupæ. These natural parasites will probably destroy a great number of the pests before the next broods mature. The occurrence of this pest, says the *Agricultural Gazette of New South Wales*, grimly emphasises the difficulties that may be expected to follow on the destruction of insectivorous birds.

Irish Blight on Tomatoes.

Mr. D. McAlpine (Vegetable Pathologist to the Victorian Department of Agriculture) reports that at the end of November he received from the Fruit Inspector samples of diseased tomatoes obtained from a line of 26 cases imported from New South Wales. The blossom end of the fruit was of a dirty green color, mottled with brown. The flesh beneath the discolored skin was of a brown, rusty color. After being cut for some time the fruits developed a rotten, disagreeable smell. On placing slices of the diseased tomatoes in a moist chamber, the fructification of Irish blight developed luxuriantly. That the fungus is the same as that causing disease in potatoes was proved conclusively by inoculation experiments. A healthy potato inoculated with spores from the diseased tomato developed Irish blight, and from blight-affected potatoes the disease was conveyed to healthy tomatoes. In Great Britain heavy losses in tomatoes from Irish blight are sometimes experienced, and in New Zealand losses have been severe. Tomato-growers in this State should keep a careful watch for signs of this disease.

Importation of Fruit, Plants, and Vegetables into N.S.W.

The New South Wales Department of Agriculture has recently issued some new regulations regarding the importation of fruit, plants, and vegetables into that State. Although these regulations do not differ very widely from those previously in force, there are several points of interest to South Australian exporters on account of the importance of the Broken Hill trade to this State. The principal items are—1. All such goods must be inspected and certified by an officer of the Department of Agriculture of the State exporting to New South Wales that the goods are fit for export and that the packages holding such goods are *new*. 2. Each case or package must

have stencilled upon it, or a tag attached to it, bearing the name and address, or a private mark registered with the South Australian Department of Agriculture, of the grower or exporter. 3. All solanaceous plants or their fruits (potatoes, tomatoes, egg fruits, capsicums, petunias, and so forth) must be accompanied by a declaration made by the grower to the effect that no Irish blight has appeared in his crop, and by an inspector's certificate to the effect that the goods are free from Irish blight and other diseases proclaimed by the Vegetation Diseases Act of New South Wales. It will be seen from these regulations that only new bags, cases, &c., will be allowed in the Broken Hill trade in future. The steaming and dipping of such articles when returned will apparently be no longer permitted. With regard to the section dealing with solanaceous fruits and plants, the South Australian inspector will have to be satisfied respecting the origin of these plants or vegetables before he will undertake to verify any declaration made by the grower.

Inspection of Vineyards.

The Horticultural Instructor (Mr. G. Quinn) writes—"The Phylloxera Board has arranged with the Chief Inspector of Fruit, under whose direction the orchard inspectors work, for those officers to observe carefully the condition of the vineyards in their respective districts, and to report to the Secretary of the Board any vineyards whose appearance is unusual. The Board may then cause a further examination to be made by their permanent inspector of vineyards. It is thought that these arrangements may prove of considerable value, as each orchard inspector is usually conversant with all the plantations in his district, and would be able to locate any disease at a comparatively early stage. Owing to the widespread character of our vine-growing industry the permanent inspector of the Board is only able to inspect each district once in two or three years, and the Board had under consideration the appointment of an additional inspector, but they decided to give this system a trial before proceeding further."

Orange Juice as a Beverage.

Californian papers report that a market demand has arisen at the leading hotels and restaurants in New York and other cities for orange juice. It is stated that this makes a pleasant, refreshing drink, is healthful and appetising. Women appear to be the chief consumers of orange juice at present, owing, it is said, to published statements that its free use will tend to prevent stoutness, besides improving the complexion. With the increasing popularity of fruit juices as beverages there should be scope for the utilisation in South

Australia of surplus oranges, cherries, strawberries, raspberries, &c. All that is required is that the juice should be extracted from ripe, sound fruit, and preserved in suitable vessels. The process of preserving is very simple. If the juice is put into bottles, brought to a temperature of 165° to 180° F. and the bottles then sealed, the juice will keep for a long period—in fact, so long as no air can gain entry. The matter is worthy of some attention at the hands of our fruitgrowers.

Agricultural Bureau Conferences.

In the January issue the date of the Northern Conference to be held at Georgetown was given as February 24th, instead of Wednesday, February 23rd. The annual Conference of South-Eastern Branches will be held at Bordertown on Tuesday, April 12th.

Imports and Exports of Fruits and Plants.

During the month of December 4,347 bush. of fresh fruits and 6,583 bags of potatoes were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act. One hundred and sixty-four bushels of bananas were destroyed. The exports to inter-State markets comprised 10,448 bush. of fresh fruits, 4,625 packages of vegetables, and five packages of plants, also examined at Adelaide. In addition 252 bush. of stone fruits were inspected and passed at Stirling North, 475 bush. of fresh fruits at Wirrabara, and 169 bush. at Clare. Under the Commerce Act 493 bush. of fresh fruits were exported to oversea markets during the same period. These were distributed as follows:—For New Zealand, 419 bush. cherries and 70 bush. oranges; for India and the East, 29 packages preserved fruit and four cases oranges. Under the Quarantine Act 3,363 packages of plants, seeds, bulbs, &c., were inspected and admitted from oversea ports.

Eucalyptus in California.

The cultivation of different varieties of our indigenous gum trees (*Eucalyptus*) is still booming in California. Very high prices have been realised for timber from numerous plantations of Eucalypts of from 15 to 25 years of age, and careful calculations show that these figures give a high rate of interest on the money invested. *The Pacific Rural Press* states that in Tulare county an orchard of 650 acres of 20-year-old peach and plum trees is being uprooted,

and the entire area is to be planted with Eucalypts. It is further mentioned that Mr. R. S. Webb has left for Australia with a commission to purchase several hundred pounds weight of seed of frost-resisting gum trees for the National Forest Reserve, as well as to secure large parcels of seed for other planters. What appears to be specially required is seed of gum trees that will thrive in high altitudes where there is a considerable amount of snow and frost, as well as for planting along the banks of large water-channels.

Soil Exhaustion.

To say that soil exhaustion is a bugbear, a nightmare, or a spectre, may be going too far, for the fact is incontestable that a farm may be depleted and left foul and undesirable. The true measure of soil exhaustion appears to be, that it is superficial, and both preventable and repairable. There is no such thing as ultimate exhaustion, and in most cases the mischief may be soon remedied. Light or weak soils may be run out in a couple of years, and as quickly brought back into condition. Heavy soils will bear more pulling, and require a longer time to fully restore ; but in either case the exhaustion is similar to that of a hungry animal, capable of being speedily removed by food. There is no final exhaustion, because exhaustion is limited by *profit*. As soon as crops cease to pay, even the parasitic tenant seeks a new field for his enterprise, and hence the land shakes off its incubus, and is ready for a fresh start. Soil exhaustion appears to be due solely to the want of one or other of the four cardinal substances—phosphoric acid, potash, lime, and nitrogen in combination. Our view is different from that of the ancients as to soil exhaustion. They looked upon it as a sort of fatigue, requiring rest, or, as the Jews thought, a Sabbath. We have thrown this idea aside, for it is evident that root and green crops make greater demands upon the soil than even corn crops. We bring the land into high condition by ceaseless cropping, and liberal feeding. What the ancients thought fatigue we now look upon merely as hunger, and we have learnt that, in order to grow successive crops, all we have to do is to feed the soil. In some cases, it is true, land refuses to grow certain crops, if sown too frequently upon the same field, but these are few in number. The reasons why this should be the case are not very obvious, and are, in fact, not yet understood ; but, so far as corn and most root and fodder crops are concerned, they do not interfere with their growth. If we take a broad view of soil exhaustion it may be regarded as a condition brought about by insufficient nutrition, preventable by the application of fertilisers, and curable by liberal treatment.—JOHN WRIGHTSON.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence for this department should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

DYING OFF OF APPLE SHOOTS.

The Secretary of the Dingabledinga Branch of the Agricultural Bureau asks why an apple tree should shoot and then die as if burnt.

The Horticultural Instructor (Mr. G. Quinn) replies—"When the root system has been seriously injured by any cause during the late autumn or winter season the full effect is not usually noticed before the early summer. The latent vitality in the uninjured portions of the tree, viz., roots, stems, and branches, is sufficient to start the dormant buds into growth and is frequently capable of nourishing the resulting shoots until they develop a considerable length, even to the extent of setting fruits. It is when this strain, *i.e.*, ripening shoots and developing fruits, comes without a corresponding supply of nourishment being made available by the roots to make up the deficiency that the trees collapse. Injuries caused by excessive moisture rotting the roots, or by root-boring insects, show in this manner particularly, and most probably the former has been the cause of these apple trees failing at the time stated."

BLOOD WORMS IN HORSES.

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.), in reply to an inquiry respecting blood worms in horses, writes—

"Re blood worms in horses : Unless the parasites are present in the faeces the symptoms are mostly insidious, and it is usually only when the condition of the animal becomes serious that attention is directed to it. The symptoms of animals affected with blood worms (*Strongylus armatus* and *Sclerestoma tetracanthum*) are practically identical. In early stages the animals do badly, lose condition, and look unthrifty, notwithstanding the fact that the horses are being supplied with plenty of feed. Later on the horses become emaciated, and if this continues complete prostration may result. There may be a haggard and anaemic look about the eyes, and the horse may have inter-

mittent attacks of colic. Horses affected with blood worms prefer the recumbent position. When the *Strongylus armatus* affects the circulation the symptoms may be obscure, e.g., unaccountable lameness in one or more limbs—stiffness not unlike sub-acute founder or partial paralysis. *Re* medical treatment: Very often a dose of laxative or purgative medicine in conjunction with an anthelmintic, e.g., oil of turpentine, will have the desired effect. But other generations of parasites may be produced, and will require treatment at a later date. When severe constitutional symptoms appear, drastic treatment may be necessary, and before commencing such it is very essential to build up the constitution with tonics and stimulants, e.g., sulphate of iron and gentian. Follow with the following powders:—Santonin, 6drms.; tartar emetic, 6drms.; powdered sulphate of iron, 1½ozs.; powdered gentian, 1½ozs.; powdered ginger, 1½ozs. Mix and make into six powders. One powder to be given in the food every second morning; then give a dose of laxative medicine, e.g., raw linseed oil, or a bran mash with stewed linseed. In young animals one-quarter the dose should be used. Treatment must be continued at intervals for some little time in order that successive generations of parasites may be acted on. Farmers should forward specimens of parasites found in dung for identification before proceeding to carry out treatment suggested.”

DISEASED FOLIAGE.

“F. L. N.,” Adelaide, has forwarded to the department the foliage of some peach trees having a pale silvery appearance, and also some leaves of a grape vine which were matted together with silk webbing. He asks for particulars concerning the specimens.

The Horticultural Instructor (Mr. G. Quinn) replies—“The leaves of the peach are affected by the pest commonly called red spider, a small mite which usually spins minute webbing on the under sides of the leaves from whence it attacks the foliage by damaging the epidermis and then absorbing the sap. This gives rise to the pale appearance referred to. These mites are favored by dry, hot, still weather, and the best preventive is to spray frequently the tops of the plants with cool water, as well as to keep the ground moist. Sulphur is an invaluable remedy against this family of pests and if dusted over the plants during a hot day the pests will be considerably reduced. Spraying with kerosine emulsion is also a very good preventive. The vine leaves which you forwarded have been attacked by a small leaf-rolling moth, evidently a species of *cacoecia*. These active little green caterpillars bind the surfaces of the leaves together, or draw the leaves over the fruit, and in this sheltered position devour the cellular tissue of the foliage or the surface of the fruit. Stone fruits, such as plums and nectarines, are also damaged, though they are rarely punctured in the manner peculiar to the codlin moth caterpillar. When the bunches of grapes are newly formed these insects

bite off the small stocks of the branchlets, spinning the dried-up berries into clumps. In this sheltered position the caterpillar enters the chrysalis stage, and the moth, which is of a dull straw color, emerges in a few days and commences to lay eggs. Wherever a strong pressure of water is available, as it frequently is in suburban gardens, these may be dislodged by squirting the plants. They may in the early stages of the development of the fruits be destroyed by spraying the plants or those parts of them which are affected with arsenate of lead, say 1lb. to 15galls. of water. This remedy, however, should not be applied when the fruits are approaching maturity."

FRUIT CASES.

"B. de G.," Nairne, writes asking for information with regard to the Standard Fruit Case Act.

The Horticultural Instructor (Mr. G. Quinn) replies—"As far as I am aware the Government do not intend to enforce the Standard Fruit Case Act until it is further amended. You may therefore continue to use kerosine cases within the State, but for inter-State trade you must use new cases. When the proposed amendments are made to our Act it will be in every way identical with the Victorian Standard Fruit Case Act. The New South Wales trade does not demand a case of a special size, but the cases that are used must be *new*. There is no regulation compelling you to line your cases with paper, though ordinarily it is a good precaution and helps to protect the fruit from bruising, and assists to maintain its appearance. The standard export case, known as the 'Peacock case,' may be obtained from various firms in Adelaide from 10s. to 12s. per dozen made up, or 9½d. each in the shooks."

WORMS IN FOWLS.

"Poultry-farmer" writes stating that considerable mortality exists in his poultry yards. Many of the birds which died were in an emaciated condition. On opening one of the birds which died he states that he found numerous round worms of a dirty yellowish color, and from $\frac{1}{2}$ in. to 2in. in length. He desires information on the subject.

The Poultry Expert (Mr. D. F. Laurie) replies—"These are known as the white worms of the alimentary canal, and belong to the nematode, genus *Heterakis*. Four species are known to infest fowls, but only two are commonly met with, viz., *H. inflexa* and *H. papillosa*. It is frequently found that death is caused by obstructions due to the habit of these worms rolling themselves in balls containing 20 to 40 worms. These worms develop directly from eggs which are eaten by the fowls; as a rule the trouble may be of long standing before death occurs. *Symptoms.*—The birds are at all times ravenous and fast lose what condition they may have. They often have a cough and running at the nostril, as if suffering from cold or catarrh. The feathers are

ruffled and devoid of sheen, and the comb shrivels and loses color. In most cases diarrhoea sets in, due doubtless to irritation and consequent septic conditions. The worms frequently pass away in the droppings, and so the ground becomes seriously tainted. *Treatment.*—If the whole flock be affected the best method to adopt is to keep them without food for 12 hours and then give them a feed of mash, to which add for each 20 fowls, and before the mash is moistened, one teaspoonful (heaped) of the following powder:—Santonin, one part; ground areca nut, seven parts by weight. This must be thoroughly and equally mixed throughout the bran and pollard before it is moistened. Care is necessary, as an overdose may be fatal. For one fowl the dose is as above in grains. Santonin alone is often recommended, but this must be administered in individual doses of three grains in a pill, and is all very well for isolated cases. Repeat this in three days and then move the fowls to fresh ground. The old yard should be drenched with strong carbolic acid wash and then forked over and dressed with quicklime. Later on a crop of rape should be sown to sweeten the soil. Where the double-yard system is resorted to this work can be easily carried out. Worms are very common, and the occasional use of the above powder is to be recommended. Obtain from a chemist and keep tightly corked.”

DUCKS FOR EXPORT.

“Ducks” wishes to know which are the best breeds and crosses for export, and also asks if the Government buys the ducklings?

The Poultry Expert (Mr. D. F. Laurie) replies—“The Pekin is the best for export, as it is hardy, quick-growing, and the ducklings attain good size at an early date. The Aylesbury is equally as large and has white skin and flesh, but as it is practically unobtainable here the Pekin must take first place. The cross between Aylesbury drakes and Pekin ducks is a splendid one. Most of the Aylesburys seen now have a strong infusion of Pekin blood. The Government does not purchase poultry for export. Suitable birds will, if delivered at the Depot, Ocean Steamers Wharf, Port Adelaide (by rail or otherwise), be prepared and shipped to England for sale on account of owners. If desired an advance will be made of 1s. each for chickens and 2s. each for ducklings approved for export. If shipping write at once to the Poultry Expert, as the season closes on March 31st.”

OBJECTION TO BLACK-LEGGED FOWLS.

“Black Orpington” writes at length on the subject of black legs on export fowls, and requires information as to why they are objected to in England.

The Poultry Expert (Mr. D. F. Laurie) replies—“No one denies the good quality of the Black Orpington, nor that it is a good table bird. The point is that the English people have prejudices. They rank poultry in the following order:—1st, white legs, flesh, and skin; 2nd, white flesh and skin and

yellow legs; 3rd, yellow legs and creamy skin. Birds with black legs are always difficult to sell owing to the strong prejudice, but as there is likely to be a bare market in England the Acting Trades Commissioner cabled that he could sell black-legged chickens of good quality. As you have such good Black Orpingtons why not put up a few pens of hens and mate them with White Leghorn cockerels—you will get all the chickens white-plumaged and white-legged, and they will grow quickly and make fine export fowls. A great many breeders are doing this. If you use a Black Orpington cock and White Leghorn hens you will get chickens of all colors, and generally with black legs. This is due to what is termed sex limitation in color: the White Leghorn cock is dominant as regards feather color and in the leg the pigment of both parents is latent."

MANURING FALLOW BEFORE SEEDING.

"J. B. T." writes—"I shall be obliged if you will inform me whether it is advisable to drill in my manure on fallow land before seeding time. If so it will save time later on and enable me to get my wheat in earlier."

The Inspector of Fertilisers (Mr. W. L. Summers) replies—"The practice of applying the manure some weeks before seeding has been adopted by a number of our farmers for a good many years with success, their object being (as stated above) to get their manure into the ground and get the seeding finished as quickly as possible when the ground is in a suitable condition. Where this practice is followed the ground should be clean, and a fair dressing of manure (not less than 1cwt.) should be applied."

TREATMENT OF HORSE WITH BROKEN KNEES.

"W. L." writes—"One of my horses recently stumbled and fell, injuring both knees severely. On one knee the edge of the kneecap is showing, but no oil is escaping. Immediately after the accident the knees were bathed with a solution of washing soda in warm water. I shall be glad if you can advise the best treatment."

Veterinary Surgeon McEachran replies—"Apply a cold linseed meal poultice. Obtain a mixture of $\frac{1}{2}$ oz. of boracic acid, $\frac{1}{2}$ oz. of prepared chalk, and $\frac{1}{2}$ oz. oxide of zinc. Before putting on the poultice dust some of this on the side which will be against the wound. Secure the poultice with a narrow bandage, not more than 3in. in width, taking care that the pisiform bone on the back of the knee is not covered by the bandage. Carefully remove the poultice after 24 hours so that the coagulum formed over the wound is not disturbed. Apply a fresh poultice as before. Leave on for 24 hours and repeat. After the third day apply carbolic oil of a strength of one part carbolic to 20 parts oil."

POISONING FOXES.

"H. L." Wirrabara, writes—"I have tried the mixture recommended in the December issue of the *Journal of Agriculture*, but with very poor success in the way of getting the fox. They took the baits all right, but it did not kill them at once. I found one dead fox about three-quarters of a mile away from the place where the baits had been laid. So I should be obliged if you could let me know the quantity of carbonate of soda, also the quantity of strychnine that is used, and if it is ordinary crystal strychnine, together with any further information you can give me."

The Chief Inspector of Stock replies—"Your correspondent does not appear to have had much experience in using strychnine. I should consider that if the fox could only get three-quarters of a mile from the spot where he took the bait that the poison acted very rapidly. The quantity of soda is immaterial—a little more or less would not matter—but it is important that too much strychnine is not used; about the smallest quantity one can handle on the point of a penknife is sufficient."

RICKETS, OR "BRITTLE BONE."

"J. A. H." writes—"I would like to ask your opinion as to the cause and cure of sheep running in scrub country having their bones as brittle as glass, so that I have known, when heading, both legs to break. If an easy remedy could be found, such as lime in the water, &c. (a neighbor has tried bone-meal, but it would seem too expensive, as a large mob would eat their heads off, they were so keen for it), it would be a benefit to sheep on many thousands of square miles in Australia."

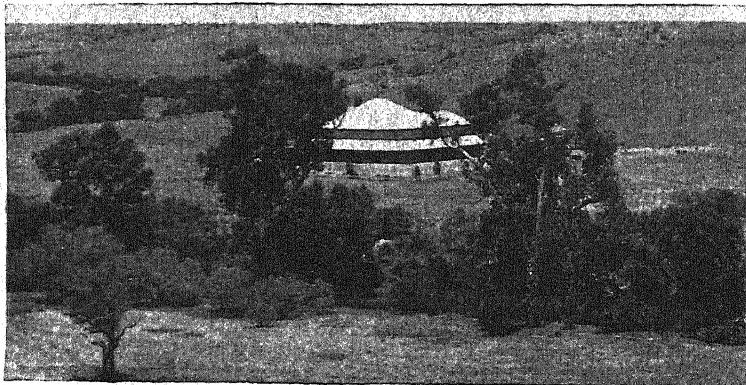
The Chief Inspector of Stock replies—"Brittle bones in sheep is known as rickets, i.e., friability of the bones, caused by want of lime and other ingredients in their food. The fact of the sheep being so keen on bone-meal indicates the nature of the trouble. A lick of 20lbs. bonemeal, 20lbs. salt, and 1lb. sulphate of iron should be mixed dry and put into a trough for the sheep to lick. Salt alone has a beneficial effect."

MANURING OF FRUIT TREES.

"H. B." writes asking for information respecting the manuring of his fruit trees, which consist chiefly of apricots and pears. The soil in his district is a stiff, clayey red loam, and the rainfall is very low.

The Horticultural Instructor (Mr. G. Quinn) replies—"I advise you in the first place to utilise farmyard manure, because it will enable the ground to take in and hold more moisture, making it more friable for tillage, and for the ready passage of the roots of the trees. It would also assist in maintaining an even and low temperature, which would be favorable to the roots,

as well as to the operations of organisms in the soil. I suggest that from 1cwt. to 3cwts. of this manure be spread around each tree, and dug in at the beginning of each wet season. If decomposed manure is available, use it; but if not, the fresh manure could be spread and dug into the soil. The layer of manure should not be completely inverted, but be mixed with the soil, and this could best be done by means of a digging fork. Artificial manure could also be used as an auxiliary to the above, say from 1lb. to 6lbs. of bonedust and from 1lb. to 1½lbs. of sulphate of potash. This could be sown over the ground from within a foot or 2ft. of the stem to a foot or more beyond the spread of the branches. This should also be dug in during the early portion of the wet season. In such dry localities a mulching of stable litter is of considerable value during the summer time, as it not only saves the expenditure of water, but it also helps to keep the ground cool. This, however, should not be dug in directly beneath the trees where it has rested during the summer, but should be scattered over the spaces between the trees before the ground is dug or ploughed."



ALLENDALE HOMESTEAD, OODNADATTA.

PARAFIELD HARVEST RETURNS, 1909-10.

BY A. E. V. RICHARDSON, B.A., B.Sc., ASSISTANT DIRECTOR OF
AGRICULTURE.

THE SEASON.

The rainfall during the year at Salisbury was just under 24in., an amount considerably above that of the average yearly fall. A comparison of the year's rainfall with that of the preceding year and with the mean of the 31 preceding seasons affords a very interesting study.

	1909.	1908.	Av. Rainfall (31 years).
January .....	.68	.. .27	.. .85
February .....	.19	.. .32	.. .56
March .....	.48	.. 1.81	.. .95
April	2.78	.. .85	.. 1.93
May	3.71	.. 3.30	.. 2.10
June	1.35	.. 3.52	.. 2.65
July.....	2.76	.. .99	.. 2.03
August	5.46	.. 2.18	.. 2.21
September	1.84	.. 2.39	.. 1.59
October.....	2.34	.. 2.59	.. 1.54
November	2.09	.. .28	.. .98
December .....	.28	.. .48	.. .77
	23.94	18.98	18.16

As is general in this district, the first quarter was unusually dry, just slightly over 1in. being recorded for the first three months. Such comparative dryness, broken occasionally by slight showers, only led to hardening of the crust of the fallows, tending to rapid evaporation of what little moisture had been conserved after a comparatively dry December. The winter season opened with a nice fall of 2.78in. in April, and continued with serviceable falls during May, June, July, and culminated in an exceedingly wet August, during which 5.46in. fell, this being a record for this month. Dry weather set in during September and continued through October, ending with a short

burst of extreme heat early in November, when the thermometer soared to 104° in the shade. This hot spell doubtless interfered with the yields of some of the earlier wheats, particularly Bunyip, Comeback, and several



MEDEAH, 4½ TONS PER ACRE

crossbreds which were well forward at this period. The prolonged cool weather during the rest of the ripening period in some measure relieved the situation and allowed the grain to fill out well. The harvesting period was marked by abnormally cool weather. There were but few days in which the stripper could be worked to advantage. Unfortunately, inordinately windy weather characterised this period, and as a result some varieties went down, others shook out badly, whilst others again were only slightly affected.



HUGUENOT, 6ft. HIGH, READY FOR REAPING.

SEED PLOTS.

About one-third of the available area was devoted to the seed plots. This was sown with some of the most useful of our grain and hay wheats. Unfortunately, owing to the small area available for this purpose, some very desirable varieties had to be omitted at seed time. The object in sowing these plots is to raise seed wheat clean and true to name for distribution. Special efforts have been made each year to carefully hand-pick the plots until each is absolutely uniform and entirely free from strange heads. In most instances this task has not been unduly wearisome, because the plots were originally raised from a few typical plants. In some instances, however, much labor has been involved in the operation, and this wherever seed wheat



A STOOK OF MEDEAH, 7ft. HIGH.

was purchased from seedsman. I may mention, by way of illustration, a typical case. At seed time 0·813 acre of well-prepared fallow was sown to Baroota Wonder with a perfectly clean drill. This seed, obtained from a prominent seedsman, was guaranteed pure and clean. At harvest time, however, the number of strange heads in proportion to the Baroota Wonder was such that we had perforce to give up all hope of cleaning the plot, and consequently stripped it for the mill. This experience is one that will be familiar to many who have purchased seed wheat in good faith. No one would object to a few strange heads in a plot; indeed, unless special precautions are taken in cleaning the harvesting machinery it is difficult to obtain absolutely clean grain. In the instance quoted above a small average square patch, containing about 10 sq. yds. was cut by hand, and a rough idea of the

purity of the plot estimated by counting the various types of head in the patch. Out of a grand total of 1,306 heads, there were 371 dark-brown or bronze in color, obviously strangers, and 935 heads with white chaff of which at least 114 were certainly not Baroota Wonder, leaving 821 which may have been seed of the type guaranteed; in other words, only 821 out of 1,306, i.e., about 63 per cent. of the heads were really Baroota Wonder, whilst 37 per cent. were strangers.

The following table summarises the yield of the various seed plots:—

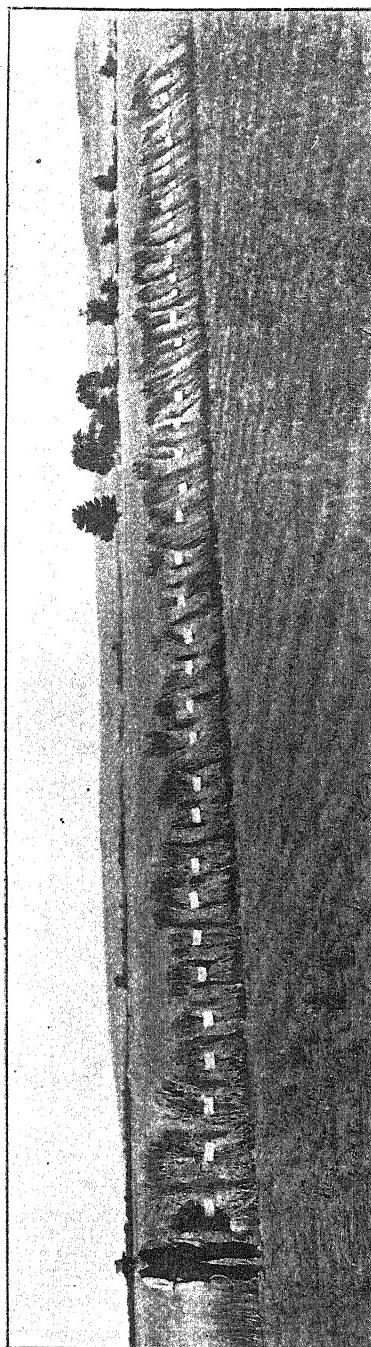
	Bush.	Ibs.
1. Federation (third year's selected)	35	38
2. Federation (selected from middle chest)	35	19
3. Federation (grown by F. Coleman)	34	38
4. Yandilla King	30	54
5. White Tuscan.....	29	6
6. Baroota Wonder	27	46
7. Triumph	26	43
8. Correll, No. 7	26	36
9. Special Comeback	24	15
10. Cumberland	23	3
11. American, No. 8	22	53
12. Gluyas	20	40
13. Bunyip	20	16
14. Marshall's No. 3	20	7
15. Medeah	18	57
16. Huguenot	16	42

A perusal of this table will reveal the distinct superiority of Federation over all other varieties grown on the farm. The difference in yield between Federation and Yandilla King, the next on the list, amounts to over 4bush., which, at current rates, amounts to 16s. per acre extra profit through using the former variety. The difference between the yield of Federation and Marshall's was 15bush., which means £3 extra profit per acre in favor of Federation. These figures are indeed startling, especially when it is remembered that all these plots were sown on uniform land, treated, so far as manure, seed, and cultivation, are concerned, absolutely identically. There can be no questioning the statement, extraordinary though it may at first sight seem, that the difference in yield between two varieties of wheat on the same farm under absolutely similar conditions is frequently sufficiently great to more than pay for the rent of the land on which the crops are grown, or the interest on its value. This has been borne out time after time in departmental experiments; hence the great necessity and justification for variety wheat tests in various districts in the State. Varieties which do remarkably well in some districts may be ill-suited for other districts, and it is imperative that the question as to what varieties to use should be solved as far as possible.

in each district of the State by the light of actual and careful experiment. Of course the season undoubtedly has a great influence on the yields of particular varieties during that particular season. So far as the above varieties are concerned, it is only fair to add that Comeback, Bunyip, and Cumberland, owing to their forward growth, felt the effect of the fierce spell of hot weather in early November. Doubtless in another season the early maturing qualities of these wheats might have considerably improved their relative places on the list. Portions of the Medeah and Huguenot plots were cut for hay. The Medeah gave 4 tons $13\frac{1}{2}$ cwts. per acre, the Huguenot plot 4 tons $11\frac{1}{2}$ cwts.

THE BREEDING PLOTS.

In the breeding plots have been gathered together a very interesting collection of wheats. Prominent among these are many of the best varieties of Indian, American, Canadian, Hungarian, and Russian wheats. Over 100 distinct varieties were sown in single rows 2ft. apart, and separately harvested by hand. Among these imported wheats are some that are likely to be of great value in this State. Their chief merit, however, lies in the fact that they possess many desirable qualities which, by crossbreeding with the very best of our local varieties, may lead to considerable and permanent improvement of the latter. The great improvement already noticeable in the con-



A FEW OF THE BREEDING PLOTS.

formation of the head and, more particularly, in the quality of the grain as a result of such crossbreeding shows that the labor bestowed on these breeding plots has not been altogether in excess of the reward.

THE CROSSED WHEATS.

These form the most important part of the work at Parafield. The volume of work has so increased that this year there are considerably over 300 separate plots. This number will be considerably augmented during the coming season. Each of these plots has been separately catalogued, classified, and described, and very rigorous selection will be exercised to secure only



A GLIMPSE OF THE CROSSED PLOTS.

the best and most promising types. It is impossible here to dwell on the details of these crosses, but opportunity will be taken in a later issue to discuss in some detail some interesting results that have been secured in this branch of the work.

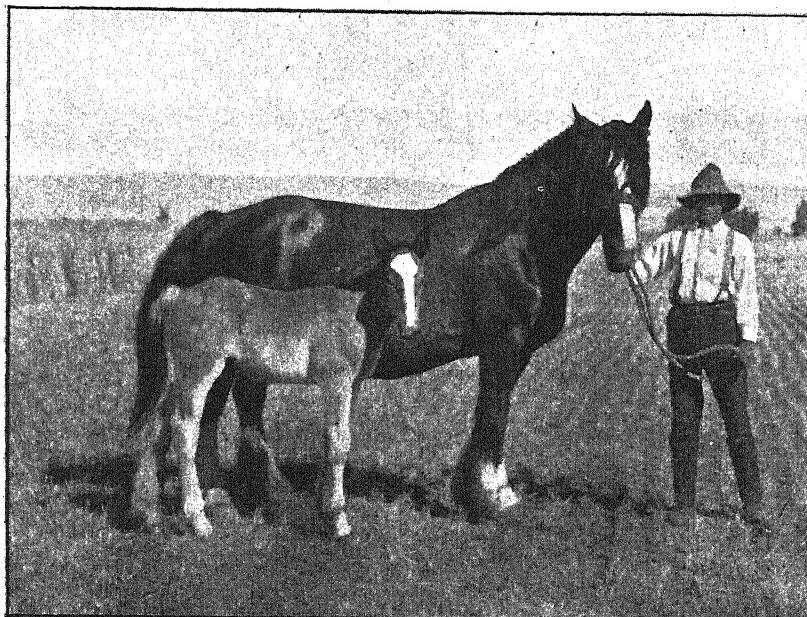
First Year Crossbreds.—The most promising of the crosses made during 1908 were—Federation x Preston ; Preston x Gluyas ; Huguenot x Triumph ; Medeah x Silver King ; Stanley x Bunyip ; Indian 4 x Jonathan ; Club-head x Federation ; Stanley x Federation ; Indian No. 18 x Comeback ; Hungarian x Triumph ; Stanley x Early Viking ; Federation x Stanley.

Second Year Crossbreds.—These were the progeny of the crosses effected during 1907, and were planted this year in 246 single rows. Many of these showed phenomenal heads, and have been the admiration of many visitors during the harvest. The following crosses of this division appear to be of exceptional merit :—1. Stanley x Federation. 2. Stanley x Yandilla King. 3. New Cross B Club x Comeback. 4. Indian No. 6 x John Brown. 5. Club-

head x Yandilla King. 6. Indian No. 1 x Comeback. 7. Indian No. 3 x Comeback. 8. Indian No. 9 x Comeback. 9. Indian No. 3 x Federation.

Third and Fourth Year Crossbreds.—Among these were a number of unfixed crosses, which were handed over to the department by the late Mr. W. Farrer, of New South Wales, the originator of Bobs, Federation, Comeback, &c. These were sown last season with the drill in long narrow rows to facilitate any cleaning that might have been necessary. These crossbred plots were watched very closely during their vegetative growth with a view of narrowing down the number of selected types to the minimum. Six of these types were selected as likely to be of service as grain-yielders. Unfortunately all these plots were near a heavy boxthorn hedge, and were consequently somewhat harshly treated by sparrows. In spite of this, however, the results were very satisfactory, comparing favorably with some of the best yielders on the farm. The yields were as follows:—

Cross.	History.	Bush.	lbs.
1. Crossbred 24	Marshall's No. 3 x Yandilla	30	50
2. Crossbred 28	White Naples x Florence.....	30	44
3. Crossbred 23	Bobs x Yandilla	29	14
4. Crossbred 12	Bobs x Gluyas	27	26
5. Crossbred 18	White Naples x Gluyas	27	20
6. Crossbred 13	White Naples x Gluyas	26	30



MARE AND FOAL AT PARAFIELD.

LUCERNE HARVESTING.

By S. McINTOSH, Manager Murray Bridge Irrigation Farm.

Lucerne (*Medicago sativa*) is beyond doubt the most valuable and productive fodder plant the world over. Although it has been grown in Australia for many years, the general public are only awakening to its true value as compared with other fodders, and it is astonishing to find the ignorance which exists regarding the various forms in which it may be made use of. Many growers, with experience dating back over a decade, confess to the fact that they have never used lucerne except as green fodder; others inform you that they once tried to turn it into hay, only to meet with failure, as all the leaves fell off, or else they apparently stacked it too green and the hay turned brown or musty. Consequently, as the lucerne crops are now at their best, and there is a keen inquiry for information in this direction, a brief description of the method which I have found most satisfactory during 18 years active' experience, may prove of more than passing interest and profit. In the first place there are a few points which must be observed and carefully practised to secure thoroughly successful results:—

1. The soil selected should be a fairly deep loam, containing a high percentage of sand rather than clay, and with a free but slow drainage.
2. Land set apart for sowing should be fallowed to a depth of from 4in. to 8in. on high land, and not more than 4in. on reclaimed swamp land. It should then be carefully worked down with the grader and Acme harrow and kept free from weeds.
3. Good, sound, clean, seed, free from dodder, must be secured and sown preferably after the first rains in April at the rate of from 12lbs. to 20lbs. per acre according to locality.
4. Seed should be lightly covered with a chain behind the seed-drill or an Acme harrow, and then rolled with a light roller.

The question constantly asked by amateur growers is, " Which do you recommend, drilling in the seed or broad-casting ? " My reply is that I prefer the latter, as I find from experience that the moisture from the drilled plots dries out more rapidly than from the broadcasted after the cuttings, while, if grazed between seasons, the sheep eat off the crown of the plants in drilled plots more readily than in the other, owing to the former being more easily available; while again they often cut out runs between rows away from their camps, which causes the plant to stand up considerably higher than they originally did above the ground surface, and the mower is liable to cut them

off below the crowns the following season if the machine is set as low as possible, as it should be. On irrigated land containing a high percentage of humus, more particularly on reclaimed swamp country, where the general surface must of necessity sink through the decay of the immense deposits of vegetable matter, I have repeatedly noted the crown of the plants, when drilled, standing several inches above the ground level, and in more than one instance have seen the mower or cutter effectively decapitate hundreds of plants in the rows. With a thick stand of broadcasted lucerne this is not possible. All the finest stands of lucerne which have came under my notice were either sown by hand or with the broadcast seedsower. The cultivation and manuring of the plots cannot be dealt with in this short article, and may be left over until the beginning of winter.



LUCERNE CROP ON MESSRS. MORPHETT BROS.' LAND AT MURRAY BRIDGE.

Lucerne sown in April should, in anything like a favorable season, be ready for the first cutting in October or November. The plant is usually rather spindly in appearance, comparatively few of the crowns having even started to form. The best guide as to the proper time to cut is the bloom, which should just be commencing to show. Where the growth is light or where the plant has to depend upon the ordinary rainfall for its sustenance it is advisable to leave the first "cut" on the ground, where it acts as a light mulch, and thus assists to retain the available moisture for the second and subsequent growths. In irrigation districts, or where water is supplied artificially, it is preferable to irrigate the land from three days to a week before cutting. This will serve to force on the second growth immediately the plant has recovered from the shock of the first cutting. The second cut should be ready in December or

January at latest, while the subsequent cuts should follow at intervals of from four to six weeks, until May. On the reclaimed land of the Murray, lucerne maintains its growth throughout the winter months, but generally from May or June until August or September according to the severity of the season, lucerne of one year's growth or over is apparently comparatively dormant above the surface.

GREEN FODDER.

This may be cut at any time, but experience has proved most conclusively both in America and Australia that the most profitable results are derived from lucerne if it is cut from when just coming into bud up to the time when one-tenth of the whole crop is showing in bloom. The cut should be allowed to wilt for at least six or eight hours of sunlight before feeding to stock, and on no account should it be used when damp or wet from dew or rain.



HAY.

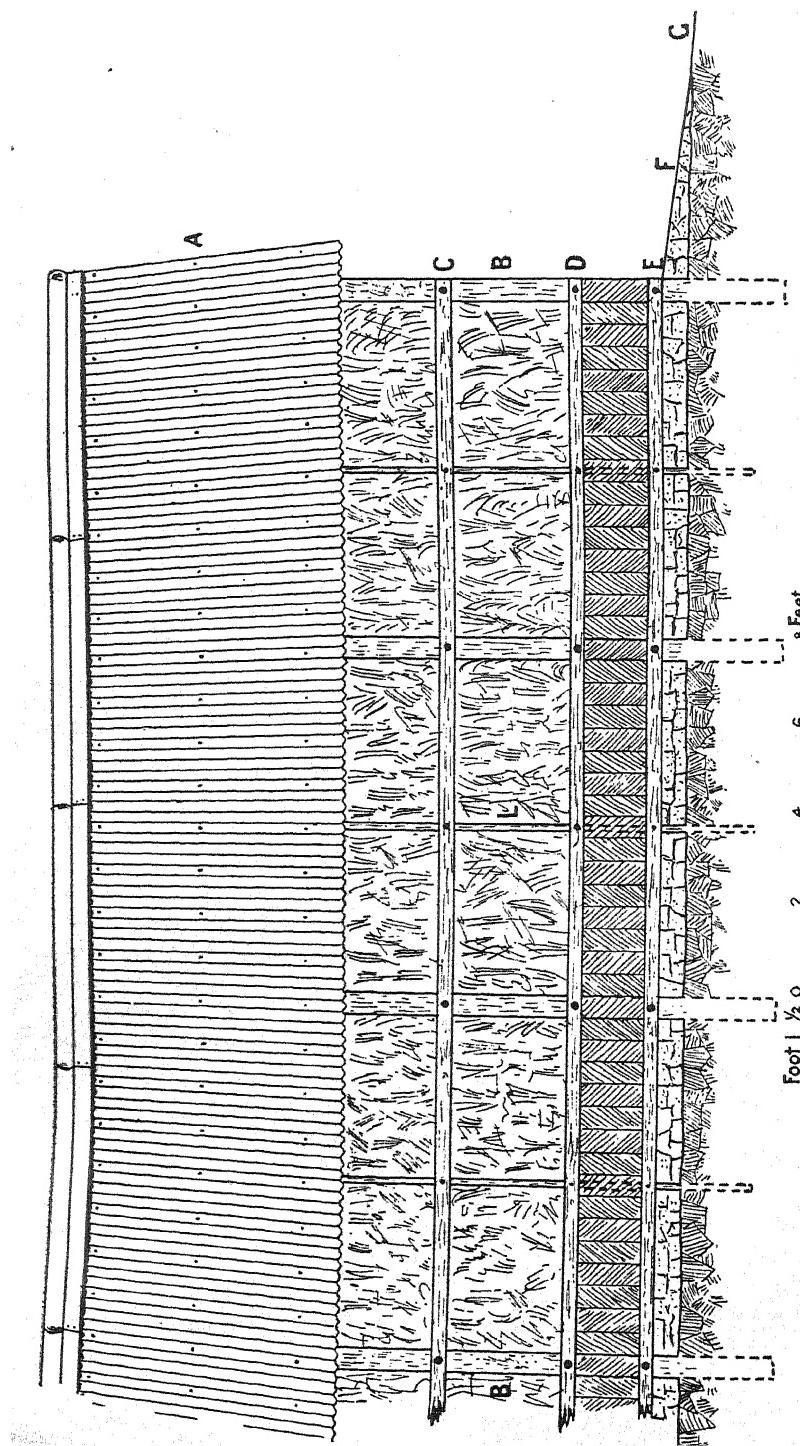
"One-tenth in bloom" is the signal for the alfalfa-grower to begin to cut his crop for hay. The American Agricultural Department has, after many years' careful tests and experiments, definitely decided this point, which is supported by F. D. Coburn in his standard "Book of Alfalfa," and also by our Australian experience generally, although I have heard more than one "expert" argue that it is more economical to let the full crop bloom, the reason given being that the stock cannot eat as much as they do when it is cut at an earlier stage; but the same men advise that after all there is not much in lucerne hay, as the stock waste so much of it. No wonder. Allowing that you have irrigated your land, where water is procurable for that purpose, sufficiently long before it is ready to cut to permit the mower to work freely, the crop should be left in the math from 6 to 24 hours, according to the weather, before it is raked into rows. The stalks should be properly wilted before raking, but every care must be exercised to prevent them becoming dry; otherwise the bulk of the leaf will be lost before stacking takes place. With a strong north wind blowing the horserake can follow the mower within a couple of hours, while, again, during a cold change, with showery weather, the cut may lie in the math for several days before it need be raked. After raking leave for a further hour or two; then fork into handy-sized cocks. Carting should follow in another 24 to 48 hours.

The following hints should be followed in hay-making:-

1. Never cut, rake, or cart the crop when it is damp with artificial moisture.
2. Do not allow the stalk or leaf to become dry before raking.
3. Cart as much as you can in the early morning, in the evening, or, if possible, when the sun is clouded. (In hot weather our men start carting before sunrise, or as soon after daylight as possible, and rest in the middle of the day.)

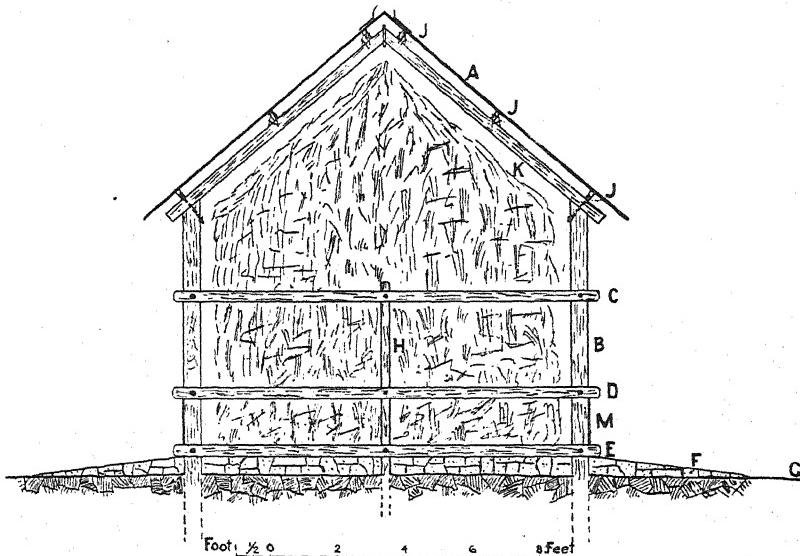
There are two distinct classes of lucerne hay, viz., green and brown. The former is secured with a minimum loss of leaf, and stacked free of any natural moisture. When properly prepared it should come out of the stack a light-green color and with a clean sweet odor. This hay commands a slightly higher price per ton than brown hay; but, on the other hand, the cost and care necessary in preparing it are greater, while cattle eat the other much more readily, and the average dairyman, with experience to guide him in the matter, asserts that the brown gives perceptibly better results in feeding than the green. If it is intended to chaff the crop, it should be prepared as green hay, in which case, in the event of the weather at the time of hay-cutting being dry and warm, the crop may be cut with a binder, but the sheaves must be small and tied loosely; otherwise the insides will "brown." *Brown hay* is cut and raked in rows the same as the green, but it is stacked while the stalk yet contains a percentage of the natural moisture. The generation of heat must of necessity take place in the stack, and this has the effect of turning the hay into a mild class of dry ensilage, with a distinctly sweet and pleasing smell. Added to the fact of its being easier to make and better relished by dairy stock, the great advantage in its favor is that it may be stacked at least a day or two before the green hay, and thus permit of the plants under the cocks getting a start in growth. Nothing looks worse on a good lucerne plot than to see the sites of scores of cocks of a short and sickly-looking yellow color while the bulk of the area is a rich green with a 4in. or 6in. growth covering it.

Hay intended for chaffcutting should be stacked in suitable stacks, according to the quantities available, as near the chaffcutter as possible, with a view of minimising the loss of leaf. A tarpaulin should be spread to receive the hay from the stack before it is handed to the feeder of the "cutter." Some years ago I adopted a method of stacking both green and brown hay intended for general feeding, which I can with confidence recommend as being most economical and satisfactory in every sense, more particularly in regard to labor saving in the matter of feeding. The accompanying sketches give the reader a general idea of how to proceed in the direction indicated. I might add that Mr. F. W. Lehmann, of Murray Bridge, one of our most practical and up-to-date lucerne-growers has tried the system and assures me he is thoroughly satisfied with the results obtained. The stack should be erected on fairly high and hard soil, if possible, and in any case the foundation should be "made up" with the backscraper or grader as shown on the plan, to allow a good drainage. Narrow stacks of not more than from 10ft. to 15ft. in width are recommended, with an 8ft. or 9ft. wall. After the hay has settled, or when it is required for use, posts are erected at distances of 8ft. apart around either the whole structure or as much as it is intended to use at once, at about 9in. clear of the stack. If no roof is required the length of the posts are 6ft. 6in. by 4in. diameter or over at the small end; they are placed to a depth of 2ft.



SIDE VIEW OF HAY SHED AND FEEDER.
A, roof; B, 6in. x 6in. x 10ft. jarrah posts; C, 4in. x 2in. V.D.L. panels; D, 4in. x 2in. V.D.L. headrail; E, 4in. x 2in. V.D.L. footrail; F, drainage slope; G, natural surface; L, intermediate posts (3in. x 2in. jarrah).

in the ground ; a breast rail (4in. by 2in. hardwood) is then bolted in 8ft. lengths to the posts with $\frac{3}{4}$ in. bolts, at a height of 2ft. from the ground surface ; below this any straight timber or lumber can be used for the mangers. Galvanized-iron cases suit admirably. At a further height of 2ft. 6in., i.e., the top of the posts, a head-rail of 4in. by 2in. hardwood is bolted to the upright with $\frac{3}{4}$ in. bolts. You have now a one-sided manger, with the haystack as the feed supply. The stock feed direct between the breast and head-rails, and any loose straws drop into the 9in. vacancy, where they are retained until the face of the stack is fed down to the full depth of the manger. When the stock have eaten out the stack to the full length of their reach the fence is simply shifted into the face, or the hay can be raked down from the roof into



END VIEW OF HAY SHED AND FEEDER.

A, roof; B, 6in. x 6in. x 10ft. jarrah posts; C, 4in. x 2in. V.D.L. headrail; D, 4in. x 2in. V.D.L. breastrail; E, 4in. x 2in. V.D.L. footrail; F, drainage slope; G, natural surface; H, 3in. x 2in. jarrah; J, 4in. x 2in. oregon rafters; K, 4in. x 2in. oregon; M, feeder or manger.

the now perfect feeder. Personally, I prefer removing the fence, as you are then sure your stock have an ample supply of feed at all times. Should a roof be required, the posts 10ft. long are used. In the event of no suitable round timber being procurable, 6in. by 6in. jarrah or red gum is suitable. The tops of these are cut off at an angle to which the lower rafter holding the galvanized iron (in 8ft. sections) is bolted with a $\frac{1}{2}$ in. bolt. The two top rafters (one on either side of the roof) meet, and $\frac{1}{2}$ in. bolts fasten the the two opposite roof sections together. In the accompanying sketches ridge-capping is shown, but it is not necessary. Both fence and roof are made up of 8ft. sections, with the end of the rafters and rails scarf'd, so that they may be fitted into the adjoining section and the whole structure bolted together. This permits of one side of the roof being removed to facilitate the erection of a new stack on the same

site, or the ready removal of the whole affair on to a new site, in the event of stock fouling the original stand. In the event of roofing the stack, the hay must be raked or thrown into the feeder after the first face has been fed off. The three principal factors in favor of this system of feeding are—the great saving in labor; the complete saving of the leaf, and minimum waste after stacking; and the insurance against short food supplies as long as the stack is available. The 3in. by 2in. V.D.L. slats between the posts are to prevent cattle horning each other. In the event of sheep feeding from these stacks a lower manger is required and the hay is forked into it.

Another method of treating cut lucerne is what is known as "sandwiching." Where clean, fine, wheat, oat, or barley straw is procurable this is certainly the most economical system of feeding. The lucerne is cut as for hay, but, instead of letting it dry, it is stacked within 48 hours of cutting. You proceed as follows:—First, a 2ft. layer of clean straw is laid down, over which is sprinkled from 15lbs. to 20lbs. of dry salt per ton of straw. A 2ft. layer of semi-green lucerne is then added, with further additions of straw and lucerne until the stack is finished. The moisture from the lucerne gradually soaks through the straw layers carrying the salt with it in solution; and thus the whole body is permeated with the natural juice of the lucerne. My experience is that the stock are just as partial to the straw thus treated as they are to the lucerne itself. I cannot recommend lucerne for ensilage, as it is much more valuable as green fodder or hay, added to which it is not a perfect silage plant.

When feeding lucerne hay to milch cows the most favorable results are secured from sprinkling the hay intended for use with boiling water at least six hours before it is fed. Lucerne chaff is a valuable adjunct to the pig and poultry ration; in both instances it should be steamed before using. Where the lucerne plant is inclined to grow rank, with long internodes and scanty foliage, it should be cut when first showing the bud if intended to be chaffed for the pig or poultry yard.

Mr. Elwood Mead, chairman of the Victorian State Rivers and Water Supply Commission, is doing much to educate the Victorian farmers and others as to the true value of the king of fodders, and last season he secured the importation of the latest lucerne harvesting machinery from America, which I hope to describe at an early date.

The following interesting extracts from Coburn's "Book of Alfalfa" gives the reader a definite idea of the value of lucerne to the stockowner:—

Stage of Growth.	Hay Worth Per Ton.	Protein Content.	Beef Produced.
	\$	Per Cent.	lbs.
When one-tenth in bloom	5·35	18·5	706
When in full bloom	4·90	14·4	562
When half the blooms have fallen	4·35	—	490

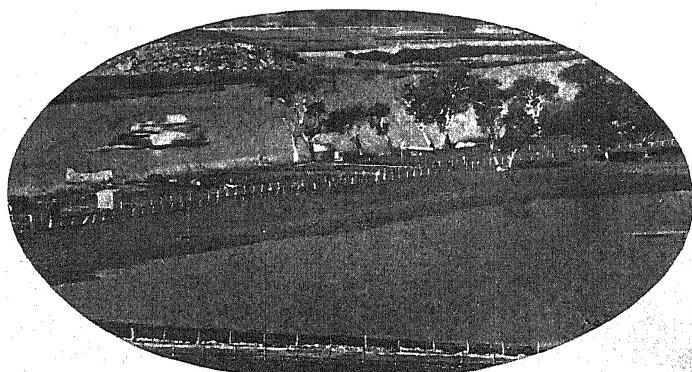
FOOD VALUES.

Variety.	Yield per Acre of Total Crop.	Dry Matter Per Acre.	Total Digestible Matter Per Acre.	Digestible Protein.
Alfalfa.....	lbs. 34,100	lbs. 8,000	lbs. 5,280	lbs. 875
Oats and peas	13,000	3,120	2,511	350
Mangolds	25,000	3,500	2,750	232

	Dry Matter in 100lbs.	Digestible Nutrient in 100lbs.		
		Protein.	Carbohydrates.	Ether Extract.
HAY.				
Alfalfa.....	91·6	11·0	39·6	1·2
Oat hay	91·1	4·3	46·4	1·5
Sorghum	82·04	2·4	40·6	1·2
GREEN FEEDS.				
Alfalfa.....	28·2	3·9	12·7	0·5
Oat fodder	37·8	1·6	18·9	1·0
Sorghum	82·4	2·4	4·1	1·2

The protein contained in 5 tons of lucerne hay is 1,100lbs., equal to the food element in 90,16lbs. of bran or 3,754lbs. of linseed meal.

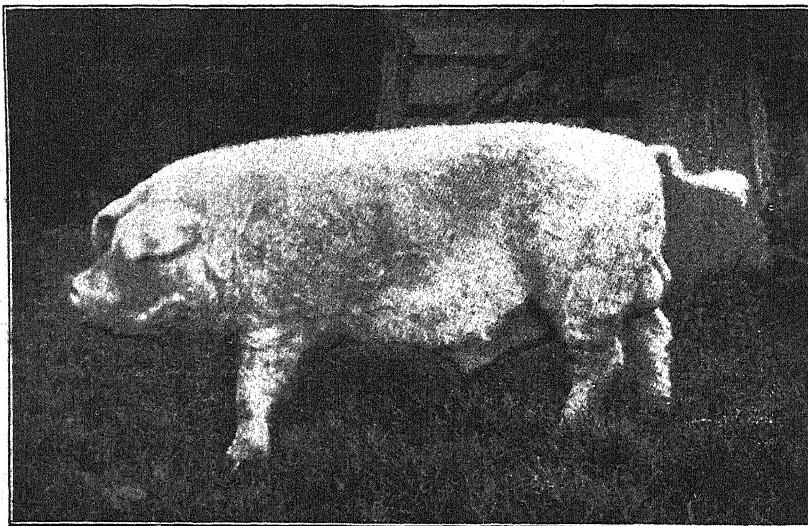
In a future article it is proposed to deal with the grazing of lucerne and the marketing of lucerne hay.



LINCOLNSHIRE CURLY-COATED OR BASTON PIGS.

By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.

For generations past there has existed in the county of Lincoln, chiefly on the eastern side, between the seaboard and Lincolnton, a lop-eared breed of large, white, curly-haired pigs, known locally as the "bacon pigs of Lincolnshire." They are believed to be the animals referred to by Low as being of "a large size and white color, with pendent ears." In their own immediate



A YOUNG BOAR WHICH WAS SOLD AT AUCTION FOR 50 GUINEAS.

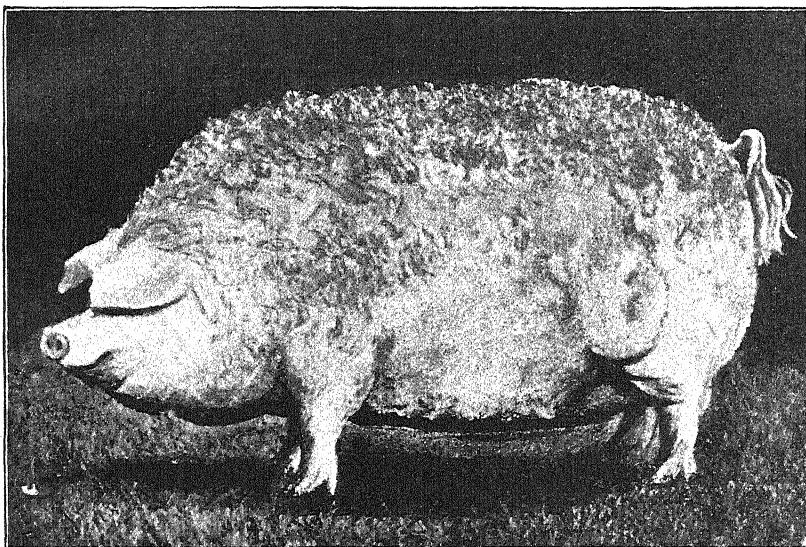
locality they have been appreciated and most carefully bred for a very long period, but it is only during the last four years that they have emerged from their native haunts and taken their place amongst the Berkshires, Yorkshires, Tamworths, and other breeds of national importance.

It is doubtful whether in earlier times their remarkable fattening propensities, which have since been revealed at Smithfield and other trials, were known even to the most ardent admirers of the "Lincoln lop-ears."

Less than three years ago, however, the practical results obtained by those directly connected with the pig, pork, and bacon industries in Lincolnshire and the adjoining counties led to the formation of the Lincolnshire Curly-

coated Pig Breeders' Association. This society, which received its certificate of incorporation on March 21st, 1907, has the following objects in view :—

1. The encouragement of the breed at home and abroad, and the maintenance of the purity of the breed.
2. The publication of a herd-book, with registration of the pedigrees of such boars and sows as are eligible.
3. The holding of shows and sales.
4. The promotion of the interests of the breed at all shows throughout the country.
5. The annual compilation and publication of a statement of transactions relating to shows, sales, &c., in respect of the breed.
6. The securing for the breeders of a fair share of the demand existing for stud stock of high quality and excellence.



ONE OF FIRST PRIZE PAIR AT SMITHFIELD SHOW, 1908.

Age, 10 months 1 week 2 days. Live weight, 588lbs.

The society is under the presidency of Lord Willoughby de Eresby, M.P., the Vice-President being Major-General Sir Mildmay Willson Willson, K.C.B., of Rauceby Hall, Grantham, himself a prominent breeder and an enthusiastic member of the association. On the council are such noted breeders as Messrs. Henry Dudding, James Cartwright, Robert and Henry Caudwell, George Freir, and C. E. Harris. Prominent amongst the Curly-coated herds there should also be mentioned those of the Earl of Londesborough, Blankney Hall; Messrs. W. H. Ward and T. Ward, both of Carrington; J. H. Smith, Firsby; J. Sharpe, Lincoln; and F. and R. Casswell, Spalding.

The society, which so far has registered 179 herds, has shown itself to be a live body keen to promote and protect the interests of the breed. They have drawn up the attached table and scale of points for the guidance of breeders and purchasers.

POINTS OF THE BREED.

Color—White. No other color admissible.

	Scale of Points.
Face and neck—Medium length ; wide between eyes and ears..	5
Ears—Medium length, and not too much over face	10
Jowl—Heavy.....	3
Chest—Wide and deep	3
Shoulders—Wide	15
Back—Long and level	10
Sides—Very deep ; ribs well sprung	10
Loin—Broad	5
Quarters—Long, wide, not drooping	5
Hams—Large, and well filled to hocks	15
Tail—Set high ; thick	3
Legs—Short and straight	5
Belly and flank—Thick, and well filled	3
Coat—Fair quantity of curly or wavy hair.....	8
Total	100

Pricked ears, long or dished nose, coarse, straight, or bristly hair are points warranting disqualification. The white color should apply to both skin and hair, but, as in most white breeds, blue or stained spots will sometimes appear. Such marks, however, are not considered a cause for rejection, provided they carry hair of the right color. Thin ears or a narrow forehead are objectionable. The hair is usually plentiful, and, as is evident from the illustrations, it is long and very curly, especially when the animal is full grown. The face is somewhat shorter than that of the large white pigs and the nose is narrower and finer. The ears are quite a noticeable feature of the breed, as they are rather large and fall forward over the eyes and face (lop-eared). They should not be too long or over-heavy, nor should they extend right over the face or show a tendency to "prick up," as in the large Yorkshire breed. For the purposes of registration the society accepts only those pigs that have not been known to have a cross of any other breed in their blood for the last five generations, and they reject any having blue or black hairs or any other peculiarities of form, character, or history which in the opinion of the council justifies refusal. Once registered, the animals are tattooed inside the left ear with the name of the association and the number of the owner's herd, whilst the owner's private earmark is placed on the right ear.

The foregoing facts are put forward to bear witness to the thoroughness and extreme carefulness which have been displayed in the reorganisation, establishment, and maintenance of this breed on a basis which shall in every detail be satisfactory to the breeders and their clients at home and abroad. Figures obtained from actual weights will show that the Lincolnshire farmers and breeders are more than justified in taking steps to band themselves together to work collectively as well as individually to extend the reputation and thereby enhance the value of the old "Lincolnshire bacon pig."

This breed was first exhibited at Smithfield in 1908, but classes and prizes have now been arranged for at the English Royal, Gloucester, Peterborough, and Lincolnshire County Shows, and last year (1909) at Buenos Ayres five classes were allotted by the council. At Smithfield these pigs will also compete in all the carcass competitions in addition to the ordinary and special white pig classes. From the subjoined table it will be seen that this breed has made (1) the highest daily gain—1lb. 15·43ozs.—of any pig weighed at Smithfield, (2) the highest average daily gain of a whole class—1lb. 13·57ozs., (3) the highest individual average daily gain—1lbs. 13·89ozs.—in the single pig class not exceeding 12 months. These figures are all the more remarkable when it is remembered that this practically unknown breed has entered the innermost circle of the pig-raising industry, and at one bound has secured championship honors at some of the most important competitions of the year.

TABLE I.—*Showing Highest and Lowest Individual and Highest Class Average Daily Gains for Different Breeds at Smithfield Show, London, 1908.*

Breed. Pairs of Pigs.	Age.	Individual Daily Gains.		Highest Class. Average Daily Gains.
		Highest.	Lowest.	
		lbs. ozs.	lbs. ozs.	
Lincolnshire Curly-coated.....	Under 12 months	1 15·43	1 11·77	1 13·57
Large White Yorkshire	"	1 15·04	0 15·91	1 9·58
Large Black.....	"	1 12·15	0 15·20	1 6·97
Berkshire	"	1 6·99	0 12·36	1 4·01
Tamworth	"	1 8·05	0 12·07	1 4·19
Middle White Yorkshire	"	1 7·55	0 13·00	1 3·51
Small breeds—Yorkshire, Essex, &c.	"	1 2·25	0 9·81	0 3·96
Crossbred or grade	"	1 10·32	1 1·77	1 5·98

Thus it is evident that under British conditions the lowest average individual daily gains in the case of this breed were higher than even the highest gains obtained by the other breeds, with the exception of the Large Yorkshire and the Large Black; and in the class averages the Lincolnshire pigs again proved their superiority in fattening qualities over all other breeds and crosses.

TABLE II.—*Smithfield Show, 1908. Single Pig, Under 12 Months.*

Breed.	Highest Daily Gain.
	lbs. ozs.
White breed—Lincolnshire Curly-coated	1 13-89
Large Black	1 7-51
Berkshire	1 8-84
Tamworth	1 10-32
Crossbred or grade	1 10-44

In this test the Lincolnshire pig not only gained more per day than any other white breed, but also fattened considerably quicker than the red or black breeds, crossbreds, or grades.

In summarising it may be stated that out of 1,059 pigs exhibited and weighed at Smithfield since the weighing of pigs began there, the Lincolnshire Curly-coated has made the highest average daily gain of any single pig of any breed, namely, 1lb. 15-43ozs.; also that its class average is higher by from 4ozs. to nearly 1lb. per day than the class average of any other breed.

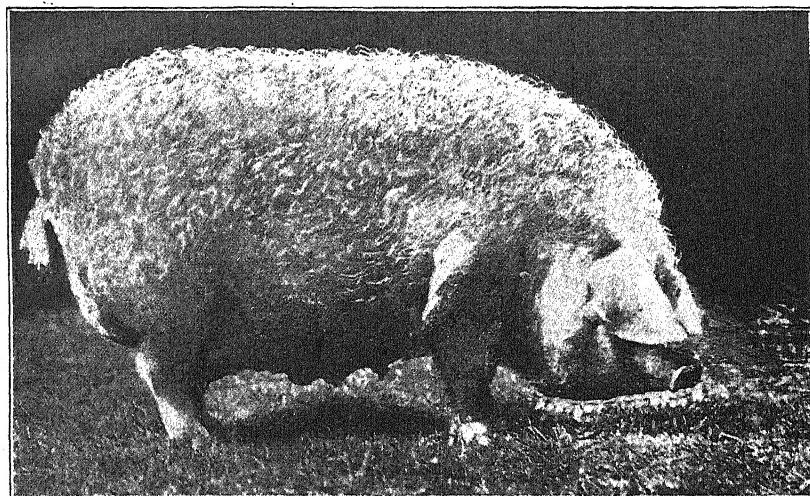
With regard to the carcass classes at Smithfield Show, 1908, this breed was not entered for competition; but the carefully and systematically kept records of Mr. H. Caudwell's herd render it possible to make instructive and attractive comparisons.

TABLE III.—*Pig Carcass Classes at Smithfield Show, 1908. One Pig Not to Exceed 100lbs. Live Weight.*

Breed.	Age in Days	Live Weight.	Prizes Alive.	Carcass Weight	Carcass Daily Gain.	Shrinkage in Killing.	Carcass Prizes.
Berkshire	94	85	3rd	64	10-89	24-70	R. & H.C. Ist&R.C.
	101	78	4th	56	8-87	28-20	
	122	94	1st	72	9-44	20-00	
	122	90	H.C.	72	9-44	20-00	
	123	91	—	70	9-10	23-07	
	145	89	—	69	7-61	22-47	
	160	90	2nd	72	7-20	20-00	
Large Black	147	96	—	68	8-93	23-12	—
	153	64	—	47	4-91	26-56	
	168	86	—	65	6-19	24-41	
Large White	112	66	—	50	7-14	24-24	—
	123	87	—	67	8-71	23-00	
Middle White	169	106	—	79	7-47	25-47	—
Berkshire (average of 7)	124	88	—	68	8-93	23-12	—
Large Black (average of 3)	156	82	—	60	6-17	26-71	—
Large White (average of 2)	117	76	—	58	7-92	23-62	—
Lincoln Curly-coats (av. of 12)	84	94	—	74	14-09	21-27	—
Average of all	133	—	—	65	7-82	—	—

These figures are remarkable in many ways, but for the present purposes it is sufficient to point out how clearly they demonstrate the fact that although the curly-coated pigs are termed the "Lincolnshire bacon pigs," yet they are

unequalled in their aptitude to fatten and mature early; in other words, they combine the desirable attributes of both pork-producing and bacon-growing pigs, and that to an unusual degree. Although Mr. Caudwell's 12 pigs were 7 weeks younger than the average age of the 13 animals in the Smithfield pens, they gave an average carcass increase higher by more than $\frac{3}{4}$ lb. per day. In another class for pigs over 100lbs. live weight but not exceeding 220lbs., and not over 9 months old, a similar table could be given; but the final figures will illustrate the point. The 10 Lincolnshire pigs were 54 days younger than the Smithfield class average (12 in the class), and yet they were, strictly speaking, not eligible for competition, because their average live weight at 23 weeks old was 228lbs., or 8lbs. too heavy. The average carcass daily gain in this instance exceeded the class average by over $\frac{1}{2}$ oz. per diem.

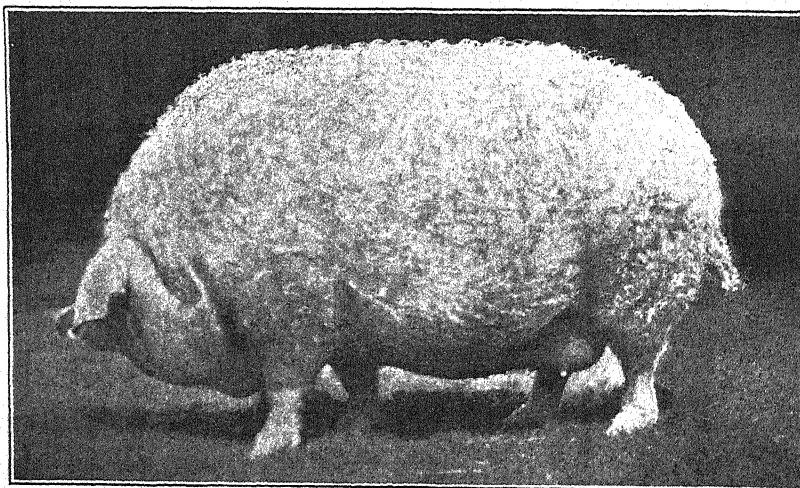


CHAMPION SOW AT ROYAL SHOW, NEWCASTLE, 1908.

The results obtained in the heavy bacon class, which is restricted to pigs not exceeding 12 months, above 220lbs. and not over 300lbs. live weight, are worthy of notice. Mr. Caudwell's five pigs, 10 months old, exhibited at Smithfield, were too heavy to compete. They averaged 586lbs. live weight as against a class average (10 in the class) of 270lbs., and similarly an average carcass weight of 504lbs. against 216lbs. The average daily carcass gain was 1lb. 8-58ozs. against 10-79ozs., and the shrinkage on slaughter was only 14 per cent, whereas the class average amounted to 19 per cent.

Enough has been said to warrant the belief that under suitable climatic conditions and judicious management we have in this breed a variety of pigs that will return at least as much and probably more carcass weight per unit

of feed than any of the recognised strains of established breeds at present in use. Again, it has been shown that they suit both the pork and bacon traders, and thus, from the farmer's point of view, they seem doubly desirable. In the words of Mr. Williams (the secretary to the society), "They are a breed which matures rapidly, either as porkers or bacon pigs, and give an average daily gain well in excess of any other breed." They are hardy, vigorous, sound, and prolific, show wonderful fattening qualities, are early to the market, and the carcasses have a much larger proportion of lean than the white Yorkshires. As evidence of the extent to which the breed has won appreciation in Great Britain I would refer to the high prices obtained at the first annual sale held at Louth in July of last year, where young boars were selling at from 15 to 30 guineas, gilts from 5 to 15 guineas. At Mr. Freir's sale at Deeping, St. Nicholas, 50 guineas was paid for one sow and 38½ guineas for another; the 38 females averaged nearly 9 guineas per head, and the 15 boars about 5½ guineas.

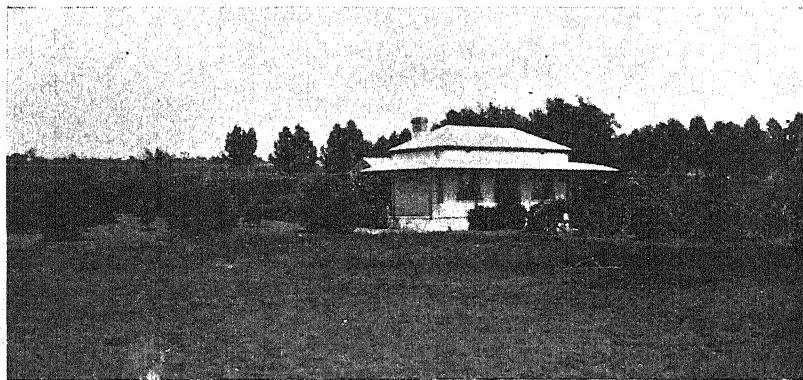


A TYPICAL FAT SOW, 2 YEARS OLD.

It is not too much to say that if the breed tests are repeated and the results obtained are on all fours with those of last year this breed of pigs must make itself felt throughout the Commonwealth, as well as in other portions of Great Britain's dominions. I am not aware that any importations have yet been made to Australasia of the Lincolnshire Curly-coated pigs, and the animals which Professor Perkins has been requested by the Government to select as the nucleus of a herd for Kybybolite will therefore afford an object lesson not only for South Australia, but for the whole Commonwealth.

According to Robert Wallace it is maintained by English breeders that "no other breed of pigs will produce, at least in its own district, equivalent

weight and quality for age, being equally good as a 'sucker' and a bacon pig, and producing the right class of animal for the pork butcher at 8 stones, 12 stones, 18 stones, or any weight up to 40 stones. A sow easily reaches 30 to 35 stones at 12 months old; 40 stones at 20 months, after rearing a litter of pigs; and 60 stones at 3 years old." They generally produce about seven for the first litter, and average 10 to 12 for a full-grown sow, bearing two litters a year. The milk becomes weaker after the sixth litter; consequently the sows are rarely kept after they are 3 years old. Detractors of the breed find fault with the heavy shoulders and "coarse" bone; but it must be remembered that with such rapid development of butcher's carcass strong, substantial limbs are essential, and the absence of the coarseness in other portions of the carcass confirm the opinion that the stout, sturdy legs are but proportionate to the general development of the breed. They are hardy and thrifty at all stages of growth, and have been very successfully crossed with Berkshires, Large Yorkshires, and Large Blacks. Finally I would add that the establishment of this breed at the Government Experimental Farm at Kybybolite is in direct accord with what, in my opinion, should be regarded as a guiding principle in the stocking of State farms. These institutions furnish recruiting-grounds for farmers in regard to bred stock, and as far as possible it should be arranged that each Government farm should be equipped with distinctive strains and breeds of stud animals, so as to widen the field of selection and at the same time test the merits of the various breeds under conditions likely to favor their development.



HOMESTEAD ON FRUIT COLONY.

FORAGE POISONING.

Loss of Valuable Horses.

The following interesting report by the Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.), respecting the investigation of the causes of deaths of horses in various parts of the State, has been forwarded to the Commissioner of Crown Lands by the Chief Inspector of Stock :—

I have the honor to forward the following report on the three outbreaks of "forage poisoning" which occurred at Mallala, Balaklava, and Warnertown.

HISTORY OF DISEASE IN SOUTH AUSTRALIA.

For many years past the officials of the Stock Department have had their attention directed to mortality amongst horses in different parts of the State. The deaths usually occurred in the summer months, and the symptoms were those of paralysis. Death generally took place in from 18 to 24 hours, but occasionally horses remained paralysed for several weeks. Very few horses recovered. In the early months of 1902 Mr. Needham (Chief Inspector of Stock) investigated an outbreak of disease amongst horses at Canowie. Accordinging to a report furnished by him to the department, 25 horses were suddenly affected with staggers and 22 horses died. He attributed the cause to the ingestion of dirty, mouldy food. Owners were then advised to remove animals and change the food, and no further cases occurred.

In 1905 Mr. Needham reported on a serious outbreak of forage poisoning at Black Rock Plain. There the cause was damaged cocky chaff, which "was not in good condition, being spoilt with damp, and was dangerous feed." Mr. Needham advised a radical change of food, and succeeded in staying the disease.

The disease has been observed in various parts of the State during the past five years, and many outbreaks of paralysis in horses, the cause of which has been obscure, may possibly have been due to poisoning by forage. The symptoms of the cases which Mr. Needham investigated in 1902 and 1905 are practically identical with those observed in the Mallala, Balaklava, and Warnertown cases.

HISTORY OF RECENT OUTBREAKS.

On December 1st, 1909, Mr. T. Irish, of Mallala, reported the deaths of two valuable mares, which had died suddenly after an illness lasting only 18 hours, and that another mare was showing analogous symptoms, viz., paralysis.

The Assistant Government Veterinary Surgeon (Mr. Loxton) visited the premises, examined the horses, and conducted two *post-mortem* examinations. Mr. Loxton found evidence of a general intoxication, and although verminous

aneurisms were present, and large numbers of *Strongylus armatus* (commonly called blood worms) were found in the large bowels, he came to the opinion that the rapid and fatal course of the disease could not be readily accounted for, and recommended further investigation. On the 6th December two geldings became paralysed, and were placed in slings. The animals were examined on the 6th by Mr. Needham and myself, and I concluded, from the symptoms presented, that we were dealing with a cerebro-spinal affection, produced by the ingestion of a toxic agent or toxic agents with the food. Treatment was recommended, but in the case of one of the horses—an aged gelding—treatment was useless, as the pharynx and tongue were paralysed, and the animal was unable to swallow. On the 11th instant, assisted by Mr. Loxton (Assistant Government Veterinary Surgeon), I conducted a *post-mortem* examination on this animal, which was slaughtered in a dying condition. The other gelding, aged 4 years, showed signs of improvement, and with careful treatment and nursing should recover. These animals had been fed on oaten chaff in which there was a large proportion of thistle. They were fed from large bins in an open yard.

Mr. Irish owns about 70 horses, and has them working on three different parts of his farm. The three lots were fed at different parts, and the disease only appeared near the homestead, where the animals had been fed on the chaff containing the thistle. Change of food, removal of horses to another part of the farm were recommended, and no other cases have been reported. A thorough cleansing of the yard and bins and disinfection were also advised.

On December 29th a report was received from Balaklava to the effect that a gelding in good condition, belonging to Sires Brothers, had died from paralysis on the 28th, and that two other horses were affected. On visiting the premises on the 30th, accompanied by the Chief Inspector of Stock, an examination of a gelding which had been placed in slings showed the characteristic symptoms of forage poisoning, and slight symptoms were also noticeable in an aged chestnut mare. A *post-mortem* examination was made on the gelding, which was slaughtered owing to its hopeless condition. The animals had been fed on mixed chaff, in which there was a proportion of thistle. They were fed from mangers situated in open sheds or yards.

At Warnertown a serious outbreak of forage poisoning took place on the farm of Mr. Hartley Hawkins. On the 27th December a three-year-old gelding became paralysed, and died on the 29th. On the 29th a five-year-old gelding and an aged mare exhibited symptoms of paralysis, and the gelding was killed on the 30th. On January 3rd a two-year old filly went down with paralysis, and was killed on the 5th January. A fifth case—a two-year-old filly—occurred on the 3rd. The aged mare and a two-year-old filly are still affected, and are being nursed and treated. The animals had been fed from mangers in open sheds and yards with mixed chaff—wheat, oaten, and barley—and about 1 per cent. of this was damaged, mouldy, and evil-smelling.

An interesting coincidence was the fact that the two-year old filly which went down on the 3rd and was slaughtered on the 5th belonged to another farm four miles distant, and had only been fed at Mr. Hawkins' farm for a few weeks. Removal to another farm, change of food, cleansing of premises, and disinfection were advised, and here also the disease has been checked.

SYMPOTMS OBSERVED.

There may be no premonitory symptoms. The horse appears stiff, and giddiness or staggering may be present. Swelling of the lips is common, with salivation, the discharge being glairy in character. Mucous membrane of eyes injected; nostrils congested with haemorrhagic spots (*petechiae*). In early stages pulse and respirations are normal, but in later stages the pulse and respirations are increased, and as death approaches pulse becomes irregular and intermittent. There is no rise of temperature. (In one case a rise of temperature was noted, but subsequent *post-mortem* examination revealed a small patch of gangrenous pneumonia—*inflammation of lungs*—resulting from medicines which had entered the trachea whilst the horse was being drenched.) The paralytic symptoms come on suddenly. There is a total loss of motor power; the horse falls prostrate to the ground, and is unable to get up without assistance. In the majority of the cases there is inability to swallow, which is very prominent in severe cases. In two cases the horses seemingly had appetite, attempted to masticate, but were unable to swallow. Owing to the animal being unable to swallow he presents a loathsome and pitiful appearance; he rests his head on nearest obstacle, feed-box, bucket, etc., endeavors to masticate food or drink water; tongue protrudes, lips become pendulous, and a muco-purulent discharge exudes from eyes and nostrils. Rapid wasting takes place, and horses in good condition attacked with this disease in its acute character very quickly become emaciated. Bowels may be constipated and urine suppressed. In one instance the urine was dark-colored. Before death horse is semi-comatose, and pulse is imperceptible.

POST-MORTEM APPEARANCES.

The principal *post-mortem* appearances are large increase of fluid in brain and spinal cord—this is a constant condition—and diffuse inflammation of the mucous membrane of the stomach. In one instance there was extensive exudation of lymph between the muscular and mucous coats. In all the *post mortems* there was inflammation of the intestines, with well-marked haemorrhagic spots (*petechiae*) in cæcum and colon. Spleen normal; liver and kidneys congested. In one horse there was an exudation of lymph on liver and lungs, and in another haemorrhagic spots on pulmonary pleura. Lungs were usually normal—except one case of mechanical pneumonia already mentioned. *Petechiae* were found in the larynx of a horse at Balaklava. The *post-mortem* appearances were those of a general toxæmia. Worms—*Strongylus armatus*, and *tetracanthum*, *Ascaris megalacephala*, and others—

were present in the bowels, and spiropteral tumors were seen in the stomach of two horses, and verminous aneurisms were present in the mesenteric and other arteries ; but in my opinion the parasites had no connection with the deaths of these horses.

No pathogenic micro-organisms were discovered in the fluid from spinal cord, but the investigation is still proceeding. A microscopical examination of damaged forage revealed the existence of *aspergilli* and other mould fungi, and feeding experiments are now being conducted.

THE CAUSE.

We are undoubtedly dealing with cases of forage poisoning, and there is justification for attributing the cause to the existence of some toxic agent or agents in the food. It is a well-known fact that mouldy, musty, or damaged fodder will kill both horses and cattle, especially if fed on it for some time ; but the exact character of the poison is unknown. Wet or damaged crops which have not properly matured are liable to become affected with moulds and fungi, and if used for horses and cattle may produce serious results. The toxic agent evidently acts on the whole nervous system, but the nature of the poison and the manner in which it acts is not at present known. In the meantime feeding experiments will be conducted in order to ascertain, if possible, the nature of the toxic agent.

PREVENTIVE MEASURES.

Animals should only be fed on sound, sweet-smelling, mature hay, chaff, grain, or bran ; mouldy or damaged fodder should be destroyed. The habit of allowing manure to accumulate in and around the yards and feed boxes must be deprecated. Accumulations of manure in close proximity to feeding and watering places are always a grave source of danger to live stock. Parasites, moulds, and bacteria are likely to be present in particles of manure, and may contaminate the food or water. Farmers should go in for a systematic cleansing of yards, feed-bins, mangers, and watering-troughs.

As soon as horses show symptoms of paralysis they should be comfortably placed in slings, and if they are able to swallow they should be fed on bran and sound chaff, and plenty of water should be supplied. Iodide of potassium in two-drachm doses should be administered in the drinking water three times daily. When the animal is unable to swallow, very little hope of recovery is entertained, but hypodermic injections of strychnine could be tried. The remaining horses should be immediately removed from the neighbourhood of infection and given a complete change of food. In a country like South Australia the live stock would benefit largely if farmers gave them suitable licks, consisting of sulphate of iron and salt, or sweet bonemeal. Farmers should immediately notify the Chief Inspector of Stock and the nearest local inspector of stock of any suspicious outbreaks amongst horses.

A further report, giving technical details, will be forwarded as soon as the investigation is concluded.

AGRICULTURE IN ARGENTINA.

The *Journal of the Board of Agriculture of England* contains an interesting article on the agricultural resources of Argentina by Mr. Herbert Gibson, a representative for the International Exhibition of Agriculture to be held in Argentina this year.

The total area of the Republic is given at 729,280,000 acres, of which 40 per cent. is at present under one form or other of rural exploitation. The greater area of land devoted to agriculture lies between the annual rainfall curves of 24in. to 32in., and consists of a belt of country about 600 miles in length, and of a width varying from 90 miles to 250 miles. Between the 18in. and 24in. rainfall lines there is another large belt of country 100 miles to 120 miles in width, where there is but little cultivation, but which is considered to be well adapted to the growth of cereals. Over another large area of country conditions are favorable to the utilisation of land by the aid of irrigation.

The average yield of wheat is 11.3bush. per acre. The rapid change from the mild spring to hot suns of early summer and the quickness with which cereals ripen are factors in this relatively low yield, and in this respect conditions are not unlike those of Australia. Ravages of locusts often form a serious menace, and in addition insufficient and unskilled methods of cultivation militate against high yields.

The area under cultivation is given as 40,271,991 acres, wheat occupying the leading place with nearly 12,000,000 acres, lucerne 11,500,000 acres, sown grasses and fodder plants 5,000,000 acres, maize 4,793,985 acres, linseed 3,129,060 acres, oats a little short of 1,000,000 acres. Of orchards there are 554,041 acres, other tree plantation 1,083,695 acres, vines 302,469 acres, and vegetables 164,793 acres. Figures such as these show the magnitude of the agricultural industry of Argentina as compared with Australia.

The enormous areas devoted to the growth of lucerne, permanent sown grasses, and fodder plants is reflected in the stock returns for 1907-8 as under—

Cattle	29,116,625	Mules and asses.....	750,125
Sheep	67,211,754	Goats	3,945,086
Horses	7,531,376	Pigs	1,403,591

Of the breeding cows, numbering nearly 15,000,000, 5,791,591 are shown as "unimproved," and the balance as "improved," the latter being pure-bred and grade cows. The Shorthorn breed is the popular breed, 87 per cent. of the "improved" cows being of that breed.

Of a total of 41,644,968 rams and ewes for breeding purposes, over 18,000,000 are of Lincoln breed, and 9,350,000 Merino.

The total value of the live stock of Argentina is given as £130,352,838, the figures having almost doubled during the past 12 years.

The following tables showing the numbers of live stock and area under crops in Argentina and the Commonwealth of Australia will be found of interest :—

LIVE STOCK.

	Sheep.	Horses.	Cattle.	Pigs.
Argentina	67,211,625	7,531,376	29,116,625	1,403,591
Australia	87,650,263	1,871,714	10,180,214	754,101

It will be seen that except in sheep the Argentine is far ahead of the Commonwealth in her live stock, and the magnitude of the horse and cattle breeding industries will be noted.

AREA UNDER CROPS IN ACRES.

	Wheat.	Oats.	Sown Grasses and Fodders.	Vines.	Orchards.	Maize.
Argentina ..	11,989,592	954,055	16,620,324	302,469	554,041	4,793,985
Australia ..	5,383,911	642,814	4,668,096	61,232	170,448	299,579

In the figures for sown grasses lucerne is included. It will be noted that without exception the figures for Argentina are immensely greater than those of Australia, and it is not difficult to understand why the Republic is such an important factor in the regulation of prices for cereals, mutton, &c., in the European market.



MARKETING OF SOUTH AUSTRALIAN PRODUCE.

Lectures by the Trades Commissioner.

(Continued from page 526, January Issue.)

WHY PRICES ARE SOMETIMES INCONSISTENT.

"I have heard complaints made about the inconsistency of prices secured for the same consignment of fruit sent to London. I have had an instance pointed out to me where a grower received 5s. a case less for what he described as exactly similar produce. Of course that largely depends on how the fruit is handled. When I sell the fruit I always want to know who the purchasers are. You may open a case of fruit and it looks all right, but further investigation may show that some of it is going off. That is probably the explanation of the incident I have quoted. No doubt the whole line was cleared out promptly at lower prices—a most proper course in the circumstances. Here is another explanation of irregularity in returns: Last year, when the price for South Australian apples got as low as 7s. a case at Covent Garden, I went and saw a number of the big retail people who were selling the fruit at 6d. a pound, and one place I visited, with which I do a direct business myself, I pointed out that 6d. a pound meant £1 a case. I said, 'You give 7s. and get £1. That is rather a big margin of profit, don't you think?' I got a stinging reply, 'Yes, but look at the waste we have got to handle; nearly a third of the case.' I saw it for myself. I saw some rubbish in the cases—bruised and battered fruit. Although they had apples ticketed at 6d. a pound, probably two-thirds of the case had been sold as cooking apples at a very low price.

FRUIT PACKAGES.

"The question has been put to me whether it would not be possible to cheapen the cost of packages for export fruit. The suggestion has been made that stringybark cases should be used. I wish to point out that it is absolutely important to keep up appearances with regard to packages. The big buyers in England attach a lot of importance to the appearance of the package. So far as cheapness is concerned it would be a foolish policy to save 3d. this end and lose 1s. 3d. the other end. It is a nice get-up they want in England, that has been emphasised over and over again. You must recollect that I am expressing the opinions of the largest retailers in Great Britain. They are pleased with our package, although in certain directions it might be improved on. We could advantageously pay more attention to the get-up, and it would pay us too. I heard a large retailer say, 'You have lovely stuff, but the get-up is not good enough. Can't you improve it? At any rate don't let it get any worse.'

"I am glad I have been asked the question about the use of stringybark cases. I have been told that because Tasmania sends home fruit in those cases we might do the same. So far as the packages are concerned I do not think we

can learn much from Tasmania. We lead at present in this respect, and every retailer in England will tell you that it pays to be careful of the way we send fruit home. Another serious point to be considered with regard to stringybark cases is this. While I do not want to discount a local industry we must take into account whether the producers are going to reap an advantage or not. Take the question of weight of two cases. The present case is 10lbs. and the stringybark package 15lbs. Supposing, for argument's sake, that a man in the Clare district sends 2,000 cases of fruit in the stringybark package. He has got to pay on 10,000lbs. extra weight in sending such a consignment on railways here and in England. If you work that out I think you will come to the conclusion that there is nothing in the advocacy of stringybark packages. I sincerely hope that, for the credit of the State, we will stick to the case we are sending now.

THE GET-UP MUST BE ATTRACTIVE.

" You must remember that in the fruit depot of some of the stores they show the produce in the cases themselves, and how important it is that the get-up should be attractive. It is nice to see South Australian fruit being displayed in neat packages. No, I emphasise with all the words I can command, do not use stringybark cases! You will be paying dead freight on unsightly packages all the while they are travelling. One grower has quoted to me an instance where he had sent apples home for two seasons in stringybark boxes and there were no complaints. That man has his own experience to guide him, of course. His may be an isolated case. I would be very sorry to see all our apples go to England in these cases. The reason for that grower getting good prices may have been that his apples were well packed and were good apples. He might have secured better returns if he had shipped the fruit in pine boxes. An odd shipment here and there does not wield much influence. It is business commonsense to give people what they wish to buy. They ask for a nice package and they ought to get it.

BEST VARIETIES FOR EXPORT.

" Cox's Orange Pippin, Cleopatra, Jonathan, Rome Beauty, Dunn's Seedling, are certainly the best to send to England; while Reinette du Canada, Dunn's Seedling, Five Crown, are most suitable for France.

TIME OF ARRIVAL IN ENGLAND.

" Apples and pears should reach England as early as possible—nothing later than the end of May. Of course, I am speaking generally, there are seasons when shipments later than this will do well; but invariably the fresh soft fruits arriving from the Continent tend to reduce prices after that time.

PEARS.

" I understand some South Australian growers were going to ship some Duchess pears to London last year, but they never arrived. At all events I did not see a shipment of this fruit, and I was advised that a shipment was coming; but I believe this was afterwards cancelled. I asked for a trial shipment of pears; but I am told now that the time was too early for South Australia. The earlier you get the pears to London the better chance for a good market. In connection with pears considerable attention must be paid to the package owing to the delicate nature of the fruit. In some of the shipments I have seen the pears have touched each other and have bruised. The buyers in England would far sooner be sure of fewer pears in superior condition than

a whole case more or less damaged. A system of packing which I am advocating is by having wood wool inserted between the pears. It will cost you a little more, but you will get that back in the increased price. Specimen cases may be seen at the Department of Agriculture intended to experiment next year in the packing of pears by this method, so as to be quite sure about the system of carriage. This will enable us to prove the best keeping varieties, and pave the way for future shipments. This is essential to satisfactory business. A lot of fruit that came to me last season was very forward, and unfortunately I had to sell it at low prices in order to clear them quickly.

THE MULTIPLICITY OF MARKS.

"The multiplicity of marks that obtained last season put consignees to an enormous amount of trouble and caused serious delay in getting delivery from the ship. To obviate this difficulty I strongly urge growers in the different districts to co-operate and ship collectively rather than individually. Apart from considerably reducing the number of marks, there are many other advantages to be obtained from co-operation.

BANANAS.

"Touching again on the question of sending all the fruit to Covent Garden, there comes this pertinent query: Why should not all the bananas be sent there, too? Yet this is far from the case, and it shows how the larger exports are being exploited by other countries. Bananas in regular shipments arrive at Manchester. Practically the same thing obtains at Bristol. Enormous quantities of bananas are sold at Bristol every year, and last year 500,000 cases of oranges were sold there also. Bananas come in from the West Indies, and there is a special store for ripening them at this port.

ORANGES.

"For a limited quantity the prospect for South Australian oranges in the old country is very good. Here again the very best must be sent, and only the best is good enough for the consumers. They will readily buy the best and reject the poor stuff. Provided Washington navels and the Renmark oranges get there at the right time the market is most favorable. Oranges ought to get to England towards the end of August, and throughout Great Britain there is a demand for probably as many as you are likely to ship for a few years yet. But I want to say this: I saw some South Australian oranges in London once that would have been better left here. The skins were very thick and the fruit generally was very unattractive. Nothing better than Washington navels and Renmark oranges go to London.

PLUMS.

"There is certainly a good market in England for varieties of plums such as Wickson and Climax, during the months of March and April. Last year an experimental shipment was sent and highly satisfactory prices obtained. Cape Colony has established a regular trade in this particular line.

GRAPEs.

"We have tried many times to get grapes into England, but have been unsuccessful. The Cape Colony people send this fruit to London; but, of course, they are very much nearer. They send the grapes packed in woodwool with satisfactory results. That idea may be worth trying if you have not already done so.

APRICOTS.

" Two years ago you could get a sale in London for apricots at from 7s. to 8s. per dozen tins. Last year Californian apricots, similar quality to average South Australian, were offered for as low as 4s. 9d. a dozen for 2lb. tins. If you like to grow the very best fruit and put in stronger syrup and grade it efficiently you could get a really good price for it. There are certain classes who do not care what they pay so long as they get the best. On my return to Adelaide I interviewed one of the leading manufacturers, and he told me this. He was prepared to put up the best grade apricots in syrup of required consistency provided he got the right sort of fruit. That is his proposition. I put it to you, is it not worth growing the right kind of apricots if you can get top prices for the article? I could sell apricots to-day if I could get the quality they want. I repeat here, grade, grade, grade! It is of no use stating on the box that the fruit has been graded. People do not trouble what is on the box, they look at the contents. I have seen some of our apricots the size of 1s. and some the size of 2s. 6d. in the same tin or box.

DRIED FRUITS.

" The bottled fruits at the Franco-British Exhibition were put up by the fruit expert, Mr. G. Quinn, and they were a great credit to him. The French Jury came along and said, 'magnificent.' They were quite right, it was a grand display; I was proud of it, as were also all the South Australian visitors to the Exhibition. I emphasise yet again that we lose the whole benefit of this exhibition work if we simply make a pretty display and do nothing else. People came to the Exhibition, then stood off, and said: 'What beautiful fruit. I have never seen quality like that in England. I wonder where I can purchase some of this.' Then, probably, you would hear somebody remark, with clever sarcasm: 'That's all they've got.' The statement was perfectly justified in the circumstances. So that suggested my policy of arranging with some of the largest retailers to stock our produce, and to put placards upon all these different shows stating that purchase could be made at, say, Whiteley's, Sainsbury's, the Army and Navy Stores, the Junior Army and Navy Stores, the Civil Service Stores, and so on. At these places they could have placards—'Purchase fruit grown within the Empire,' 'South Australian Raisins,' 'South Australian Apricots,' and so on. Messrs. Crawford & Co., of Adelaide, sent to the Exhibition a display of tinned goods, and I wish to thank that firm publicly for having backed up the South Australian exhibit. We got the Grand Prix for apples, and deserved it.

RAISINS.

" South Australia can produce the quality of raisins needed for the best trade in England, but the grading, to say the least, is far from satisfactory. Buyers will pick out a well-graded package sent from some other country, and say, 'If you can grade up to this you can get top prices. If you cannot grade, you won't get the price, and that's all about it.' Well, that is a pretty clear statement of the position. I have sent samples out here in order to show the producers what is required, and they must unerringly follow that. A large quantity of raisins has been sent home, and the story everywhere is that the grading is not good enough. If you see a South Australian box and a nicely-graded package from some other country side by side, as the big retailers are so fond of showing you, you see the difference at once,

ENTIRELY OUR OWN FAULT.

"In many instances it is our own fault if we get low prices for our raisins. People in England will give us the preference every time if we send them the right class of goods. We must try to avoid what I may facetiously call having a small timber yard in the boxes. The article must be clean and faultlessly graded. I have seen myself five different kinds of raisins in one handful. The fruit with which we compete is all stemmed and capitally graded. If we mean business, then we will have to do the same. When I was at one large retail establishment, one of the officials selected a box of South Australian raisins, and said—'Now, 20 per cent. of that is beautiful—just what we want. Give us fruit like that, and we will give you the price.'

QUINCES.

"There is a market in England for quinces. Two lots were sent to me last season and realised 7s. and 10s. a case. A good price would be returned for a nice article in season.

FROZEN LAMB AND MUTTON.

"It is universally admitted that the minimum of handling is an all-essential item in dealing with frozen lamb and mutton. When I got to London my first duty was to call upon the various shipowners and experts, and I am pleased to be able to say they were very courteous to me. They offered me every facility for inspection on any of the ships bringing our produce with the result that I can say this. The primary sources of harm to our meat may be attributed not to the time that it is being transferred out of the ship into the lighter in London so much as after it has left the ship *en route* to the cool store. After it leaves the ship it is difficult to sheet home the blame. If you speak to the cold store people they will blame the men on the lighters and the men on the lighters blame the ship. It is very often impossible to follow the consignments after they have once left the ship, because frequently the barges come down the Thames in the middle of the night. It is not a particularly happy task to have to sit on a Thames barge all night until the small hours of the morning to witness the discharging of our produce into the London stores. I was at the cold store when a lighter came alongside. It was a damp night and the hatches were off. Rain was pouring into the holds on to the carcasses. The men were in about the same hurry to get out of the cold store as I was, and the result was the carcasses were emptied in anyhow. That would happen not once but again and again. That is one of the chief disadvantages of London. We want some system of inspection; but I wish to say here that a lot of the damage is not done on the ships. The majority of the vessels take a great amount of care, and I should imagine there are times when a good deal more care could be taken at this end.

HANDLING IN LONDON.

"A very large proportion of the lambs and mutton now sent to London is eventually consumed north of Birmingham; in fact, throughout the large manufacturing centres of Lancashire and Yorkshire, good plain carcasses are preferred to fat ones. Then it is under this heading that our own lambs in particular would come. On the arrival of a shipment of lambs at the London docks, this is something like the amount of handling the carcasses receive—from the ship to the lighter, from the lighter to the cold store, cold store to van, van to the railway, a long railway journey, and then very nearly the same performance at the other end. It is possible to have some super-

vision during the time the ship is discharging into the lighter, but what may happen between that time and the arrival at the cold stores it is not always possible to follow out. With some trifling modification the foregoing description will apply to butter, eggs, and apples.

AVOIDING GLUTTED MARKETS.

"As against this condition of affairs in London, it is my intention to take a view of the more important outports individually to show the methods and cost of handling that obtain there. Before, however, I pass on to this there is another quite as important feature to be considered. It is something that only too often happens, and that is the crowding of an already glutted market. That was a condition that unfortunately was only too well demonstrated when marketing South Australian lambs last season. Owing to the action of speculators with New Zealand lamb, and the unprecedented supply of fresh meat coming from Holland, right up the middle of December at the rate of 60,000 carcasses a month. The sale of South Australian lamb in London was seriously interfered with. The ultimate result was that ships were arriving with such quantities of lamb and mutton in London that the cold stores actually had to refuse business. The stores were full, and there were further consignments arriving in the steamers. What other effect could this have on an already depressed market than to still further depress it? This should not have happened. From actual experience I can assure you that the result was a panic. If a proportion of our lamb was sent to Avonmouth, Liverpool, Manchester, or Hull, it would be landed right in the centre of the people who consume it, and, as I shall explain, the handling would be limited, because at all these ports the ships conveying produce go right alongside the cool stores. Again, and in this point I shall give you figures later on, you can store in an outside port for three months for what it costs to store in London one month.

REASON FOR PANIC PRICES.

"I will tell you my experience last season. When prices were being slaughtered in London I put a consignment of lambs in Liverpool. In any case I was better able to hold at Liverpool because storage rates were not running up to the same extent. You can store there for three months for practically the same money that has to be paid for three weeks in London. You get the advantage of that. If one place is glutted you can hold in the other. If lambs and other lines of produce were more evenly distributed, there would not be these panic prices; because, even if you do not get any more for your produce at these outports, the fact that you relieve the London market tends to improve matters there. I ought to say just now that our best lambs will favorably compare with the prime New Zealand article for the London trades. If this season you get an average of 8s. a head for lambs, you will have to be satisfied. From inquiries I have made I believe 8s. will pay. You must consider other means of increasing the revenue of the farm. Why not take up poultry as an adjunct? In connection with lambs, if farmers who wish to ship on their own account would co-operate and grade and export under one mark, there would be a far better chance to get good prices. I strongly urge that after considerable inquiry and personal experience. A point that has to be remembered about lambs is that in England about Christmas time there are tremendous supplies of poultry pouring into the market. Then, again, rabbits have affected the price of lambs very materially. Millions of them are retailed at 6d. each. One rabbit will do an East End family for two meals and they get 2d. for the skins.

INSURANCE RATES.

" But even if you do not get better prices—although I do not think there is any doubt about it—you have less claims to make on the insurance companies for damaged goods. That is a serious item, because during the last few seasons the claims for damages have been so heavy that the insurance rates have mounted up year by year, and I am afraid they are going to be higher yet. These frequent claims for broken shanks and mishandled carcasses need not occur at the outports, where the handling is much less than in London, very much less I may say. Last year the insurance companies found that the amount paid in claims far exceeded the premiums. You cannot blame them for protecting themselves, and the call for such a policy is becoming far more insistent. I wish particularly to emphasise that, so as to save future disappointment and expense. Three years ago the insurance rates were very much less than they are to-day, and that is very indicative. If we send to the outports the rough and frequent handling is minimised, and losses do not occur to anything like the same extent. You can retain cheque for any damage done. The question of insurance is a very important one for producers.

HONEY.

" I am glad to say that the fact is now established that honey can be sold in the United Kingdom in any quantities we are likely to produce. We have been told that the British people do not like our honey. I introduced it into such places as Manchester, Bristol, and Cardiff through the Franco-British Exhibition. Here I may relate an instance. A gentleman came into my office, in London, and said: 'I was looking at your honey at the Exhibition. It is not bad honey.' I said I agreed with him. He said: 'I bought a pot of it.' I said: 'I am very glad to hear that.' He said: 'And then I bought a case.' I was getting interested. He said: 'How much have you got left?' and I told him I had a good deal. He then wrote out a cheque, and said: 'Give me £100 worth.' I want to go right back to the beginning. Before I went to England I attended a meeting of beekeepers, and they informed me that they would be satisfied if they got 2½d. f.o.b. at Port Adelaide for their honey. When I reached London five cases of honey were sent to me. An agent, who was in a position to know something about the business, advised me to go to some of the dozen or so honey-brokers in the metropolis. I did so, and they told me that Australian honey was no good, and offered 12s. to 14s. per cwt. for it. I realised that those gentlemen were interested in Californian, French, German, and Italian honey, and that probably they did not want competition from elsewhere. I then went to a large retailer, whose weekly capacity for trade is 1,500,000 eggs, 2,000 sides of bacon, and the total output of 30 Danish butter factories.

HOW THE TRADE WAS STARTED.

" When I interviewed the proprietor he said he never touched honey. I pointed out to him that the establishment had 100 branches, and that not only could a satisfactory profit be made by him, but that he could also help weld the Empire together by taking up South Australian honey. The question in reply was: 'How are we going to have it put up?' I informed him that I would help in that myself. It was arranged that I should buy apparatus for melting the honey, and a store was set apart for me, and the first lot of honey put in the stores was bottled under my supervision and the Government label put on it. The honey was exhibited at the Westminster Food Show, and samples given away. I had placards showing: 'This honey may be obtained

at so and so.' At the Franco-British Exhibition I obtained permission to sell honey on royalty. On one Saturday night 1,400 1lb. jars of South Australian honey were sold, and from 600 to 800 daily. By a system of tests which I established I was able to ascertain that many repeat orders came in, and so proved it was not the British public that objected to the honey. At present several large retailers in London are selling South Australian honey, and it has been put on sale at Birmingham, Manchester, Bristol, and Edinburgh. The local producer is as near as possible in direct touch with the consumer in England.

POPULARISING HONEY AS A FOOD.

" If the apiarists are going to ask for their honey more than 28s. per cwt. in London—equal to 2½d. per pound f.o.b. at Port Adelaide—they will not sell any more, for this gives the dealer, after packing in jars, only 1½d. per pound profit. This is not too much after all the trouble. Then there is the competition—Chili, California, and Jamaica honey to contend with. The Jamaica article is offered at 22s. 6d. I am pushing honey for all I know in England as a food, and this should be done in Australia too. In England they are getting the doctors to order honey as a necessary diet for children, on the ground that sugar in that form is preferable to the manufactured article. Has it ever struck you, as it has struck me, how seldom we find honey on the tables in South Australia? If we maintain the quality of the article shipped to England we can easily keep up the market. Honey from certain districts suits certain buyers, and, as a result of inquiries, the Government department now know what kinds are preferred in various parts of the United Kingdom. I would have looked for fresh channels of disposal, only I was advised that a short year had been experienced, and that consequently stocks would be small.

NEED FOR ADVERTISING.

" The question of spending money in advertising must undoubtedly be considered. If large business houses thought they could sell their goods as well without advertising they would never spend such large amounts in that way. It is time beekeepers of South Australia did something of the same kind if they want influential English firms to be attracted to their product. If the Apiarists' Association can form a co-operative society it will pay to spend some amount in advertising every year. Supposing the annual yield is 500 tons or 1,000 tons, if they are getting an extra £2,000 or £3,000 by export it is surely worth while to advertise a little. If, instead of being in an association, it became a co-operative society, it would be much better for the business. At present a few beekeepers are making the price for the men who do not export. It is highly essential that prices and markets should be regulated, and that can only be done by co-operative action. Then, in addition to maintaining quality, you must keep up continuity of supply.

SOUTH AUSTRALIA FOR ITSELF.

" It has been suggested that South Australia should join the other States in trying to market honey in England. I smile at that. I have seen in the papers a report by Mr. A. T. Coghlan (Agent-General for New South Wales), wherein that gentleman has stated that he had submitted samples of New South Wales honey to various persons, who had said that the reason why the highest price offered was 14s. to 18s. per cwt. was because South Australia was unnecessarily

cutting the price of honey in London ; and because firms whom the South Australian Government were supplying were retailing it at 6d. The funny thing is that four of the firms which offered Mr. Coghlan 14s. to 18s. have been buying South Australian honey at 28s. I could not recommend the substitution of larger packages for the present tins in the shipment of honey. Blending may prove a good thing after awhile ; but at present it is better merely to keep separate the honey from different districts. One buyer prefers Port Lincoln honey and another asks for another variety.

BEESWAX.

" I have been asked whether I can place beeswax in England. With a good certificate it would realise 1s. 6d. per pound without trouble. I would not mind taking all you have now at 1s. 3d., and chancing the result, if pure and in 10lb. blocks. A lot of beeswax on the London market is paraffin wax.

EGGS AND POULTRY.

" I am not here as a poultry expert, to teach you your business of raising poultry, but to give you an idea as to what I have learned during the last three years in probably the greatest markets in the world in this particular connection. My ideas may not meet with the approval of all, but what I have to say will be, I hope, worthy of your consideration. In the first place, it is admitted, I think, that South Australia is one of the finest countries in the world for the rearing and production of poultry. I have seen most of the poultry-raising countries of the Continent with a view to finding out how the business was conducted there, and I have also been right through Great Britain. Two years ago I represented South Australia at the Reading International Congress, where an opportunity was given for the interchange of ideas between all the leading experts in the world. As far as South Australia was concerned she played no small part in that huge Congress. When I gave my paper there on egg-laying competitions, about which I knew something, I told them of the great strides you were making, what a marvellously progressive country this was, how wonderfully we have grown in 70 years, and particularly the remarkable progress made in the last decade. Several of the leading breeders have sent out here for some of your laying strains. Some arrived in very good condition, and they were most particularly pleased with them. Before I left I had numerous inquiries as to the best place to get these marvellous birds. At the Franco-British Exhibition I had ' 1,538 eggs laid by six pullets in 12 months ' placarded. I have seen thousands of people stand looking at the notice. ' Is this America or Australia ? ' and such expressions, were frequently uttered. I used to tell them it was all right.

(To be continued.)

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on January 12th, 1910, there being present Messrs. A. M. Dawkins (chair), C. J. Tuckwell, T. N. Hardy, C. J. Valentine, Professor Perkins, Colonel Rowell, J. Miller, and G. R. Laffer.

It was decided that the trial of stone-gathering machines be held about the second or third week in March, and that the Northern Yorke's Peninsula Bureau Field Trial Society be asked to make the necessary arrangements for same.

The Minister returned resolution passed at September Congress of the Bureau, asking for the appointment of several veterinary surgeons to be stationed in different districts, with the intimation that the request could not be acceded to at present.

The Secretary reported that on making inquiries in regard to the charges for carriage of stallions by rail (in accordance with resolution of Congress), he found there was practically no difference between the charge for stallions and racehorses, when in horse-boxes, except that the latter were carried back from races free if not sold. Free carriage was, however, allowed in the case of stallions when exhibited at shows or if sent to the stallion sale and not sold. It was pointed out that the carriage of racehorses also led to the swelling of the passenger revenue by no small amount.

The Secretary called attention to Congress resolution asking the Board to endeavor to arrange for a room in which delegates to the Congress could meet during show week. The idea was that something should be done to enable the delegates from the different Branches to meet in a friendly way and exchange views on matters of interest. He had made inquiries, and had been offered a large room in a central position in a Rundle Street café, but this would not be available between 12 o'clock and 2 p.m. each day. Some discussion ensued. Members thought that all that was necessary was a room where letters could be addressed and arrangements made for delegates to meet one another. The Secretary was instructed to inquire whether a room could be obtained for this purpose.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. B. and G. Giles and A. and E. Seidel, Bowhill; M. Robertson, Coomooroö; J. A. Laffin and W. G. Williams, Miltalie; J. Harvey, A. Urlwin, A. H. Harvey, N. Tate, V. Jenkins, L. Jenkins, R. Bagster, A. J. Harvey, E. Whittlesea, E. V. Harvey, J. Hartmann, J. J. Allington, E. Allen, G. Heidenreich, H. J. Coker, A. H. Baylis, H. Heddle, and A. E. V. Richardson, B.A., B.Sc., Salisbury; C. E. Ewens, and M. J. Chirgwin, Kingscote; W. T. Vowles, Shannon; R. Sabine, Golden Grove; S. Sanderson, Davenport; F. J. Mutton, A. T. Duke, F. Burgess, and C. Solly, Watervale; C. Cowland, Rhine Villa; J. McDonald and J. M. Mitchell, Kalangadoo; W. Miller and F. Keane, Clare; W. H. Howard, F. Barnes, and T. Symons, Petina.

The Minister of Agriculture forwarded resolution from the Australasian Fruitgrowers' Conference, recommending that a board, consisting of two growers and one scientist, be appointed in each State to inquire into the cause of "bitter pit" in apples. The Secretary said that the previous year the Federal Government were asked to undertake an inquiry into this disease, but nothing had been done in the matter. Pending the appointment of the proposed board a delegate in each State had been deputed to collect from growers all information possible on the subject. Considerable discussion followed; and, while members were agreed as to the necessity for investigating the cause of this disease, they were of opinion that the proposed committee would not accomplish the desired end. At the instance of Mr. G. R. Laffer it was resolved—"That in the opinion of members this is a work which demands the services of a trained scientist, and the board would therefore respectfully recommend the Minister of Agriculture to seek the co-operation of the Ministers of Agriculture in the States interested in apple-growing to depute a competent man to undertake the investigation." It was agreed further to point out that if the Department of Agriculture in Victoria was prepared to co-operate it had in Mr. McAlpine a man thoroughly capable of doing the work, and one who possessed the fullest confidence of fruitgrowers. [A report by Mr. McAlpine on "Bitter Pit" appears on page 610.—ED.]

This being the last meeting of the Board at which Professor Perkins would be present for 12 months, opportunity was taken by the members to wish him a pleasant and instructive holiday. Members spoke in appreciative terms of the Professor's work at Roseworthy College, and especial mention was made of the valuable results from the experimental work undertaken by the Professor. In thanking the members for their remarks, Professor Perkins said he took a deep interest in experimental work, and he could safely say that the results achieved at the College Farm had fully justified the money and labor spent on them. It was his intention during his trip to Europe to send for publication regular notes on matters of interest connected with agricultural work.

Professor Perkins said that he had received a number of reports from persons who had purchased selected seed wheat from the College. Owing to the wet season the yields in some cases had been low, but the following were satisfactory:—King's Early Wheat (first selection), J. E. Stewart, Avoca (Victoria), 43bush. per acre; H. and A. Grant, Laura, 24bush.; A. L. McEwin, Anama, 30bush.; S. Springbett, Sandy Creek, 24bush.; P. Kirkland, Balaklava, 32bush. King's Red (second selection), W. A. Reichstein, Booleroo Whim, 31bush.; H. Laffer, Owen, 29bush.; Faulkner Bros., Stansbury, 24bush.; Anama Station, 28bush. Gluyas (first selection), A. Jericho, Blyth, 30bush. Bearded Gluyas (first selection), W. A. Reichstein, Booleroo Whim, 26bush. Jonathan, H. Laffer, Owen, 40bush.; J. H. Riggs, Redbanks, 44bush. Square-Head Barley (third selection), W. A. Reichstein, Booleroo Whim, 43bush. The yields given are for areas of one and a half acres to 40 acres.

STREET TREES AND FRUIT TREE AVENUES.

The following notes on the subject of the public planting of fruit trees in streets and roads have been translated from the German by Mr. H. W. Andrew, of the Department of Agriculture, from Nicolas Gaucher's valuable "Hand-book of Fruit Culture" (4th edition), published by Paul Parey, Berlin, 1908. Although the general recommendations made on this subject for European conditions do not altogether apply here, there is still much reason why our local governing bodies should, in keeping with the local conditions, make a start to emulate the work done by our German cousins on these lines; for instance, owing to the sparsely settled nature of much of our country it would be hardly feasible to grow the more perishable fruits outlined herein, but owing to the suitability of our climate and soil for the growth of the olive, for example, and the lessened liability of this fruit to suffer from the depredations of mischievous persons as well as animals, it should be a fit tree for planting on public roads, more particularly in the slightly warmer districts of the State. Planted at distances of 40ft. or 50ft. apart, and trained so as to make fairly large trees, there is no reason why the olive should not, in the course of a few years, give a generous return for the amount invested in any plantations. Of course, such work would only be accomplished gradually, and should be done thoroughly, giving proper attention to the protection of the trees when young from the attacks of wandering stock. Again, in some hilly districts, where the rainfall is heavier, the walnut might be grown as an ornamental and profit-bearing tree. On the plains also wherever the tree thrives well there is very little to prevent the utilisation of the almond as a roadside tree, because it is self-evident that with the increase in the number and the more frequent contact with them the risk of theft would tend to become diminished. From a point of beauty nothing exceeds the almond tree when in blossom, and it also affords a grateful shade over the footpaths, and would not necessarily keep them damp by obstructing the passage of the sun's rays during the winter season.—G. QUINN, Horticultural Instructor.

Streets and roads afford splendid ground for the growing of fruit trees, and may be said to be almost made for them. The soil here is improved by the fertilisers which are washed on to the sides of the road with the blinding after every rain, and consequently the older the road the greater the improvement in this respect. Where, however, there are deep cuttings or barren

stretches of road this of course does not apply, as in such instances instead of humus and loose soil accumulating the reverse happens, and consequently such localities are not at all suited to the production of fruit, and can only be successfully utilised by excavating large holes and filling them up with good soil. This work being very costly cannot be recommended, especially as there are many stretches of road eminently suitable. Except where these unfavorable conditions obtain, fruit trees flourish exceedingly well on roads or streets, and their yield is good, providing there is fair weather in spring and summer.

The trees are planted either on the more or less elevated footpaths alongside the street, or at the edge of a field adjoining them—the latter is to be preferred in the case of narrow thoroughfares. Again, planting just away from the street is more desirable than immediately upon it if the soil be unproductive. These street plantations are entrusted to the care of the public and do not require to be so carefully guarded as is generally considered necessary. Thieving is for the most part insignificant, "street-wardens" and laborers being the appointed guardians of these trees.

In order that the great economic importance of growing fruit trees on the roads might be more fully recognised, most of the German States have gone to considerable trouble to have their streets and roads planted; and he who is acquainted with the beautiful orchard avenues in the streets of Wurtemberg, Baden, Hessen, Saxony, Nassau, Hanover, and the Rhine Provinces can but wish that all of the States adopt this practice. In most of these provinces the maintenance and supervision of the trees are delegated to the "street-wardens" and to men specially employed, while they are managed and controlled by experts.

The plantations of fruit trees on the sides of the street are certainly much to be preferred to those of forest and ornamental trees, for, with due appreciation of the aesthetic landscapes of Linden trees, elms, &c., we must not overlook the fact that these and the poplar, which are so often planted, provide only harboring places for cockchafers, caterpillars, and injurious insects of various kinds. When once the people in the neighborhood of these fruit tree avenues have accustomed themselves to the trees, they soon have the protection of the community, and systematic thieving, plunder, and injury are thus prevented.

Besides avenues of pears, apples, cherries, and plums, there may also be found walnuts and the edible chestnut. In the proximity of cities and towns, principally where large shady trees are desired, it will be found that the two last-named answer this purpose, provided that soil and climate are appropriate. To convey an idea of the value of this branch of the horticultural industry, it may be stated that the yield of pome fruits (apple, pear, &c.) from the roads and streets of Wurtemberg in the year 1878 reached a total of £400,000. The question of fruit-growing along roads is thus of the greatest economic

importance, and of no mean dimensions, and it is therefore highly desirable that it enjoy still further attention and expansion.

There are few of these plantations in North Germany, and those to be found do not always present a good type. I have often had the opportunity of seeing that the good condition of trees in the different States ceases abruptly with the border. As the soil and climate are the same on one side of the border as on that of an adjoining State it is very evident that only unsuitable trees, faulty planting and attention are responsible for these striking differences in appearance. If street plantations are to be objects of beauty as well as of great utility, which they can be made to be, then it is absolutely essential they be looked after by the practised hand and not by the "wood-maker." Ignorance in horticulture must never be suffered on any account, and the man who is unfamiliar with the operations of pruning and cultivation of fruit trees does better to leave them severely alone. With regard to the fruit tree, absolute lack of pruning and cultivation are not so harmful as faulty pruning and faulty cultivation. It is also necessary that more importance be given to the shape, general condition of the trees, and particularly to the choice of varieties than hitherto has generally been the case. It is far better to obtain excellent trees, thoroughly adapted to the purpose in view, than less costly ones which may be inferior. In connection with the planting of trees for public roads and streets especial care should be taken that only the best-shaped and well-conditioned trees be selected, and thus, instead of setting a bad example, serve as faithful and model types.

When once the planting of the street or road with fruit trees has been decided upon, it is important to realise the fact, so often overlooked, that there are only a few groups and species of trees suitable for this purpose. Plums of all kinds, cherries, and nearly all apples, also our table pears, fulfil requirements in this direction. So long as fruit trees are not planted on the street, but immediately adjacent, the choice is not so limited, but owing to the fact that fruit trees are now often planted on the street itself the question becomes a different one, and in consequence of this innovation new conditions have arisen which force me to admit that only the following fruit trees may with advantage be planted in our streets:—

- (a) The walnut (*Juglans regia*).
- (b) The edible chestnut (*Castanea vesca*).
- (c) The cherry (*Cerasus avium*).
- (d) The pear (*Pyrus communis*).

With respect to trees of the two last-named fruits it will be borne in mind that only varieties of an erect habit of growth should be utilised, particularly when dealing with the planting of pears might those varieties have the preference which are grown for cider-making, for the reason these kinds have a much more vigorous growth than the table sorts, and because it is likely that their crops of fruit will be less pilfered by the traveller. In addition, I would suggest when it is proposed to plant any of the above species of trees

on the street itself such ought to be done on the one side only, and preferably always on the northern side. [The southern side in the southern hemisphere.—ED.] Planting immediately on either side of the street, altogether regardless of the variety of tree, will result in the thoroughfare being subjected to too much shade, which may increase the cost of its maintenance to such an extent as would exceed in value the income derived from the trees, besides the possibility which might arise of hindering traffic at such places.

Avenues of unsuitable trees leave a decidedly unpleasing impression on the beholder, and surely people are now convinced that when one tree in a row is bent over to the left, and another inclining to the right, and so on, they present a truly dismal appearance depressing in effect. When this fact is known, or can be realised, it is impossible for me to understand how people will believe that all fruit trees are suitable for growing on the roadside.

"BITTER PIT" OF THE APPLE.

[Report by D. MCALPINE, Vegetable Pathologist, in the Victorian *Journal of Agriculture*, July, 1909.]

I have the honor to report, as requested, on the subject of what is commonly known in Australia as "Bitter Pit" of the apple. It is unfortunately only too well known to applegrowers, both here and in other parts of the world; but it is necessary to understand clearly what is the nature of the disease to which this name is applied, in order to prevent confusion.

The common name was first given to this disease by Dr. Cobb, formerly Vegetable Pathologist to the New South Wales Department of Agriculture, in 1895, although it had previously been mentioned in the *Agricultural Gazette of New South Wales* for 1892 under the heading of "Another obscure disease of the apple." The name of "Bitter Pit" was suggested, because, as he remarks, "The brown spots, when several are taken out and placed at once

in the mouth, have an undoubted bitter taste," although he also found dead tissue between the skin and the core which had not a bitter taste. It is also interesting to note that in connection with the disease so named he had seen no evidence that would prove the disease to be caused by a fungus.

The latest from America in connection with this disease is by Brooks, in the *Bulletin of the Torrey Botanical Club* for September, 1908, on "The Fruit Spot of Apples." The writer states that there are two distinct fruit spots occurring on the apple, one of which is called the "Fruit Pit" and the other the "Fruit Spot," the latter being associated with a distinct fungus.

It is the former which agrees with our "Bitter Pit," although the writer was unable to detect a bitter taste in the browned tissue. With regard to the cause and occurrence of the disease, he writes—"Microscopical examination of fruit pits have given no indication of the presence of fungi or bacteria. Brown tissue from the surface pits and from the more deeply seated vascular regions has been transferred to various culture media, but always without securing bacterial or fungus growth."

Although the cause is unknown, the disease itself has characteristic symptoms, and these, together with its distribution and varieties affected, will be given as a necessary preliminary to the recommendations to be made for dealing with it.

SYMPTOMS.

In some varieties the external indications appear while the fruit is still on the tree, and in others they only appear after the fruit is picked and stored. In the case of "Prince Bismarck" I have seen fully 90 per cent. of the fruit "pitted" while on the tree, and in the case of Jonathans they may appear sound when shipped and the disease develops on the voyage. Whether developed on the fruit on the tree or in storage, however, there is no mistaking the appearance presented by the disease. Numerous small depressions, somewhat hemispherical in shape, usually appear on the surface of the apple, and on examining the tissue beneath these sunken areas the cells are found to be brown and shrunken, thus accounting for the depressions. The spots ultimately become dark-brown, appearing almost black, and several of them may run together to form one large spot. This spotting of the surface is usually accompanied by an internal browning of the tissue. When the fruit is cut across numerous isolated brown spots are seen, but when carefully examined these are found to be in reality continuous strands of brown tissue surrounding the vascular bundles. The surface spots may occur without the internal browning and the disease is then sometimes distinguished as "surface pit," and the internal browning may occur without any evident surface markings. I have found both the outer and the inner brown tissue to have a bitter taste when kept in the mouth for a short time, but some good observers have failed to detect it. In the case of pears the bitterness is very pronounced, resembling that of quinine.

DISTRIBUTION.

The disease known as "Bitter Pit" or "Fruit Pit" not only occurs in Australia, but has been found in the United States of America, Canada, and Cape of Good Hope. It is also well known in Germany, where it is called "Stippen," from its supposed resemblance to the dots used in stippling by artists. In the Australian States it has been the cause of severe losses for some years past—in Victoria, New South Wales, South Australia, and Tasmania—and the disease will probably become troublesome in the other States as the fruit-growing area is extended.

VARIETIES AFFECTED.

The pear and quince are known to be affected by this disease, but it is in the apple that it is best known and has done most serious damage. There are some varieties much more susceptible than others, and there are even some which seem to escape it in one district and yet succumb to it in another. The Cleopatra, for instance, is generally regarded as one of the most susceptible, but I have found Annie Elizabeth, Shockley, and Prince Bismarck equally bad. The following is a list of varieties of apples more or less subject to this disease in Victoria :—

Annie Elizabeth	Lord Wolseley	Ribston Pippin
Cat's Head	Magg's Seedling	Rome Beauty
Cleopatra	Munroe's Favorite	Rymer
Cox's Orange Pippin	Newtown Pippin	Scarlet Nonpareil
Esopus Spitzenberg	Nick-a-jack	Shockley
Five Crown	Northern Greening	Stone Pippin
Gravenstein	Northern Spy	Sturmer Pippin
Hoover	Prince Alfred	Winter Majetin
Jonathan	Princess Alexandra	Yates (comparatively free)
Late Wine	Prince Bismarck	

RECOMMENDATIONS.

Although the disease has been known for at least 30 years—having been described in 1879 by Sorauer as occurring near Berlin—and has received attention at the hands of scientists and practical growers, we are still in the dark as to the real cause of it, and consequently no means of coping with it are known. Since no definite organism has been found associated with it, one is led to the conclusion that it is a constitutional disease, and the abnormal physiological conditions may be due to a variety of causes. The advice to grow sorts that are not liable to it is no remedy, any more than it would be a remedy to give up growing apples altogether in districts affected with the disease. There is no doubt as to the serious losses caused by it, and this, combined with the variety of opinions expressed by leading growers as to the numerous factors tending to produce it, renders it imperative that a thorough investigation be undertaken to discover the cause or causes of it and the exact conditions under which it occurs, so that some means may be devised for overcoming it.

Since the disease is common in several States of the Commonwealth and as it is not one that can be properly investigated by any single State, it would be the duty of a National Department of Agriculture to undertake it. But since there is no machinery at present in existence for this purpose, I would strongly recommend that the different States particularly interested, viz., New South Wales, Victoria, South Australia, and Tasmania, should provide the necessary funds and appoint a skilled investigator who would devote his whole time to an experimental study of this serious disease, both in the laboratory and in the orchard. Experiments could then be conducted in each State, and, from the very nature of the disease, its investigation would require the co-operation of the leading growers in the respective States. Every possible factor which contributes to the growth of the tree and the formation of fruit would require to be dealt with. The nature of the soil in which the affected trees grow, the rainfall and the season, the cultivation, manuring, and pruning, and even the stocks used—as Northern Spy is liable to it—would all demand attention. The chemical composition of the apple when diseased would require to be ascertained at different periods of its growth, with special reference to the sugar and acid content and the increase or decrease of tannic and malic acids in the cell sap. To trace this disease to its source and find a remedy for it will tax the energies of the trained specialist, and the increasing losses due to it each year call for an exhaustive investigation without delay.



THE WHEAT MARKET.

With a full supply of wheat in all the States the Australian wheat quotations are entirely dependent this season on oversea markets, and this state of things is likely to continue for several months unless any of the States overshoot. There has, therefore, been a singular uniformity of price in Adelaide, Melbourne, and Sydney, the best Adelaide quotations being only about $\frac{1}{2}$ d. per bushel under Melbourne and Sydney, while at times the price at Port Adelaide equalled that in the other States. The price at Port Adelaide reached 4s. 4d. in the early part of January, but during the month it dropped to 4s. 1d. as the result of an easier tendency in London and reports that Australian shipments had been resold at lower rates.

Beerbohm's Evening Corn Trade List of December 24th, after giving the results and probable results of the harvest in all the wheat-producing countries of the world, says—"The table given above of the world's wheat crop, revised to date, shows that this year's yield, assuming the latest official Russian estimate to be correct, amounts to over 449,000,000qrs., against 399,000,000qrs. last year and 397,000,000qrs. in 1907. The total for the three years amounts to 1,244,000,000qrs., against 1,239,000,000qrs. in the three years ending 1906, the yearly average being 415,000,000qrs. and 413,000,000qrs. respectively. The abundant crop of 1909 has, therefore, just about made up for the short yields of 1908 and 1907. The world's visible supply on August 1st, 1909, was very small, being only 7,650,000qrs., against an average supply in the previous 10 years of 11,950,000qrs. In addition the invisible supply, both of wheat and flour, was also very much below the average—evidence that the world's crops of 1907 and 1908 were distinctly below the yearly requirements. This year's production, however, is ample for all current requirements, and should leave a moderate surplus over for reconstituting stocks, which were dangerously low at the commencement of the season. At the same time one large crop after two small crops can hardly be expected to materially affect prices, especially when it is borne in mind that the consumptive demand tends to enlarge at an increasing rate every year. The course of prices in the spring will no doubt be governed to some extent by the result of the Indian crop, to be harvested in March-April, 1910; the present prospects of this crop are stated to be quite favorable."

Date.	LONDON (Previous Day).		ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
	Per Bushel.	Per Bushel.			
Jan. 7	Jan. 5/1 $\frac{3}{8}$.	Nov. 5/4 $\frac{1}{2}$, sailor ..	4/2 $\frac{1}{2}$ to 4/3 ..	4/3 $\frac{1}{2}$..	4/3 to 4/3 $\frac{1}{2}$; 4/4 $\frac{1}{2}$ to 4/5 s.
8	Jan. 5/1 $\frac{1}{4}$	sailor ..	4/3 $\frac{1}{2}$..	4/4 to 4/4 $\frac{1}{2}$..	4/4 $\frac{1}{2}$ to 4/5
10	—	..	4/4 ..	4/4 ..	4/4 to 4/4 $\frac{1}{2}$
11	Steady, quiet ..	..	4/3 to 4/4 ..	4/3 to 4/3 $\frac{1}{2}$..	4/3 to 4/3 $\frac{1}{2}$
12	Dull, easier tendency ..	..	4/3 ..	4/3 ..	4/3 s.; 4/3 b.
13	Dull, easier tendency ..	..	4/3 to 4/3 ..	4/3 ..	—
14	Steady, quiet ..	..	4/3 ..	4/3 ..	—
15	Steady, quiet ..	..	4/3 ..	4/3 ..	—
17	—	..	4/3 ..	4/3 ..	—
18	Dull ..	..	4/2 $\frac{1}{2}$ to 4/3 ..	4/3 $\frac{1}{2}$ to 4/3 $\frac{3}{4}$..	4/2 $\frac{1}{2}$ to 4/3
19	Very dull ..	..	4/2 $\frac{1}{2}$ to 4/3 ..	4/2 $\frac{1}{2}$..	4/2 to 4/3 $\frac{1}{2}$ b.
20	Dull, offered lower ..	..	4/2 to 4/2 $\frac{1}{2}$..	4/2 ..	4/1 $\frac{1}{2}$ to 4/3 $\frac{1}{2}$ b.
21	Dull and neglected ..	..	4/1 $\frac{1}{2}$ to 4/2 ..	4/2 $\frac{1}{2}$..	4/1 $\frac{1}{2}$ to 4/3 b.
22	Steady, quiet ..	..	4/1 $\frac{1}{2}$ to 4/2 ..	4/2 $\frac{1}{2}$ to 4/3 b.	—
24	—	..	Do. ..	4/2 $\frac{1}{2}$ to 4/3 b.	4/2 to 4/2 $\frac{1}{2}$
25	Jan. 5/1 $\frac{1}{2}$, Liverpool, 5/1 $\frac{1}{8}$ s.	..	4/2 $\frac{1}{2}$ to 4/3 ..	4/2 $\frac{1}{2}$ to 4/3 ..	4/2 to 4/3
26	Dull, easier tendency ..	..	Do. ..	4/3 to 4/3 $\frac{1}{2}$..	—
27	Steady, quiet ..	..	Do. ..	Do. ..	4/2 to 4/3 $\frac{1}{2}$
28	Steady, quiet ..	..	Do. ..	Do. ..	4/3 to 4/4 s.; 4/2 $\frac{1}{2}$ b.
29	Steady, quiet ..	..	4/2 $\frac{1}{2}$..	Do. ..	—
31	—	..	4/2 $\frac{1}{2}$..	Do. ..	4/2 to 4/3
Feb. 1	Very dull ..	..	4/2 $\frac{1}{2}$..	Do. ..	4/2 b.; 4/3 $\frac{1}{2}$ s.
2	Dull and neglected ..	..	4/2 ..	4/2 ..	4/2 to 4/2 $\frac{1}{2}$; 4/3 $\frac{1}{2}$ s.
3	Quiet ..	..	4/1 to 4/2 ..	4/2 to 4/2 $\frac{1}{2}$..	4/1 $\frac{1}{2}$ to 4/2 ..
4	Very dull; offered lower ..	..	4/1 to 4/2 ..	4/2 ..	Do.

STREAMER FREIGHTS.—Port Adelaide to London, 22s. 6d. per ton (7 $\frac{1}{2}$ d. per bush.); Port Adelaide to South Africa, 20s. to 21s. 3d. per ton (6 $\frac{2}{3}$ d. to 6 $\frac{1}{2}$ d. per bush.). The market for tramp steamers is merely nominal. For February loading rates are quoted at from 24s. to 25s. per ton (7 $\frac{1}{2}$ d. per bush.) to United Kingdom-Continent, and for March loading 24s. per ton (7 $\frac{1}{2}$ d. per bush.) to United Kingdom-Continent. Port Adelaide to Melbourne, 10s. per ton (3 $\frac{1}{2}$ d. per bush.); Port Adelaide to Sydney, 13s. per ton (4 $\frac{1}{2}$ d. per bush.).

SAILOR FREIGHTS.—During January several sailing vessels were chartered at Adelaide for United Kingdom-Continent ranging from 28s. to 23s. per ton (7d. to 3 $\frac{1}{2}$ d. per bush.). For South Africa sailing vessels have been chartered at from 18s. 9d. to 20s. per ton (6d. to 6 $\frac{1}{2}$ d. per bush.) according to size.

RAINFALL TABLE.

The following table shows the rainfall for January, 1910, at the undermentioned stations, also the average rainfall for January, and the fall for January, 1909:—

Station.	For Jan., 1910.	Avg'e. for Jan.	For Jan., 1909.	Station.	For Jan., 1910.	Avg'e. for Jan.	For Jan., 1909.
Adelaide	0·02	0·85	0·74	Hamley Bridge	0·35	0·97	0·90
Hawker	0·14	0·58	0·53	Kapunda	0·70	0·91	1·18
Cradock	—	0·65	0·23	Freeling	0·47	0·93	0·96
Wilson	0·49	0·71	0·16	Stockwell	0·73	0·84	0·95
Gordon	0·55	0·29	0·06	Nuriootpa	0·49	0·89	1·04
Quorn	0·47	0·65	0·15	Angaston	1·08	0·84	1·12
Port Augusta	0·81	0·55	0·19	Tanunda	0·58	0·91	0·94
Port Germein	0·13	0·73	0·70	Lyndoch	0·62	0·91	0·56
Port Pirie	0·28	0·66	0·50	Mallala	0·11	0·98	0·66
Crystal Brook	1·24	0·68	0·43	Roseworthy	2·20	0·87	0·70
Pt. Broughton	0·12	0·73	0·76	Gawler	0·82	0·79	0·60
Bute	0·33	0·83	0·43	Smithfield	0·13	0·77	0·46
Hammond	1·29	0·70	0·15	Two Wells	0·02	0·90	0·65
Bruce	0·88	0·27	0·11	Virginia	—	0·91	0·54
Wilmington	0·66	0·83	0·24	Salisbury	0·51	0·85	0·68
Melrose	0·88	1·33	0·58	Teatree Gully	0·10	1·14	0·74
Booleroo Centre	1·08	0·90	0·28	Magill	0·04	1·04	0·88
Wirrabara	0·55	0·68	0·60	Mitcham	0·05	1·01	0·86
Appila	0·88	0·67	0·35	Crafers	0·24	1·79	1·49
Laura	2·00	0·71	0·52	Clarendon	0·07	1·31	0·89
Caltowie	0·93	0·70	0·37	Morphett Vale	0·05	1·06	0·75
Jamestown	0·35	0·69	0·42	Noarlunga	0·05	0·76	0·45
Gladstone	0·75	0·66	0·43	Willunga	0·09	0·86	0·48
Georgetown	0·27	0·71	0·46	Aldinga	0·05	0·77	0·43
Narridy	0·36	0·66	0·40	Normanville	—	0·67	0·41
Redhill	0·04	0·60	0·72	Yankalilla	—	0·71	0·61
Koolunga	0·17	0·69	0·59	Eudunda	2·00	0·88	0·62
Carrieton	4·33	0·74	0·17	Sutherlands	0·55	—	0·24
Eurelia	2·66	0·74	0·27	Truro	0·33	0·82	0·99
Johnsbury	1·34	0·52	0·28	Palmer	0·31	—	0·56
Orroroo	0·97	1·13	0·25	Mount Pleasant	0·31	0·89	0·89
Black Rock	1·24	0·71	0·20	Blumberg	0·70	1·37	0·96
Petersburg	1·26	0·89	0·36	Gumeracha	0·93	1·18	1·12
Yongala	0·53	0·69	0·23	Lobethal	0·38	1·22	1·20
Terowie	1·33	0·74	0·17	Woodside	0·44	1·18	1·08
Yarcowie	4·10	0·61	0·26	Hahndorf	0·64	1·26	1·03
Hallett	1·19	0·80	0·42	Nairne	0·20	1·20	0·81
Mt. Bryan	1·75	0·34	0·26	Mt. Barker	0·83	1·12	0·86
Burra	1·33	0·80	1·86	Echunga	0·16	1·28	1·10
Snowtown	—	0·76	0·79	Macclesfield	0·25	1·12	0·94
Brinkworth	0·13	0·47	0·60	Meadows	0·33	1·35	1·00
Blyth	0·03	0·79	1·17	Strathalbyn	0·24	0·79	0·76
Clare	0·11	0·97	0·75	Callington	0·08	0·93	0·43
Mintaro Central	0·11	0·65	0·59	Langhorne's B.	0·22	0·59	0·75
Watervale	0·32	1·03	1·04	Milang	0·12	0·84	0·54
Auburn	0·68	1·12	1·36	Wallaroo	0·10	0·64	0·51
Manoora	1·23	0·63	0·66	Kadina	0·12	0·61	0·35
Hoyleton	—	0·94	0·91	Moonta	0·12	0·60	0·46
Balaklava	0·03	0·86	0·70	Green's Plains	—	0·67	0·31
Port Wakefield	0·26	0·65	0·54	Maitland	—	0·68	0·46
Saddleworth	1·11	0·86	0·84	Ardrossan	—	0·61	0·42
Marrabel	0·11	0·86	0·86	Pt. Victoria	0·01	0·53	0·41
Riverton	0·87	0·80	1·14	Curramulka	0·01	0·78	0·30
Tarlee	0·81	0·89	1·33	Minlaton	—	0·58	0·37
Stockport	0·21	0·96	0·80	Stansbury	0·02	0·75	0·68

RAINFALL TABLE—*continued.*

Station.	For Jan., 1910.	Av'ge. for Jan.	For Jan., 1909.	Station.	For Jan., 1910.	Av'ge. for Jan.	For Jan., 1909.
Warooka	0·08	0·51	0·34	Bordertown	0·07	0·94	0·09
Yorketown	0·12	0·59	0·55	Wolseley	0·16	0·75	0·45
Edithburgh	0·60	0·58	0·77	Frances	0·22	0·91	0·45
Fowler's Bay	0·05	0·49	0·08	Naracoorte	0·10	0·92	0·75
Streaky Bay	—	0·54	0·12	Lucindale	—	0·89	0·52
Pt. Elliston	0·05	0·47	0·20	Penola	0·71	1·18	0·77
Pt. Lincoln	0·05	0·69	0·59	Millicent	0·52	1·14	1·08
Cowell	—	0·51	0·23	Mt. Gambier	1·08	1·58	1·42
Queenscliffe	—	0·52	0·28	Wellington	—	0·98	0·51
Port Elliot	0·11	0·78	0·83	Murray Bridge	0·07	0·81	0·57
Goolwa	0·09	0·74	0·93	Mannum	0·33	0·55	0·52
Meningie	0·05	0·75	0·97	Morgan	0·45	0·57	0·38
Kingston	—	0·87	0·64	O'Riordan Corner	0·55	0·59	0·26
Robe	0·01	0·88	0·67	Renmark	0·65	0·53	0·31
Beachport	0·29	1·13	0·49	Lamaroo	0·07	—	1·42
Coonalpyn	0·20	0·86	0·91				

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,300 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, North Terrace, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

The manager of the Government Produce Department reports on February 1st:—

EGGS.

The month of January ushered in the hot weather and caused traders and collectors in South Australia to clear their eggs at the best price offering. Hot weather eggs are not well suited for pickling or chilling, and as a consequence they are quitted at best as fresh. The Circles System is beginning to tell its tale, as may be seen from the figures below. It is at the present time when the ordinary market egg is unreliable, that the circle-graded eggs are coming steadily to the front as the best line offering.

Eastern States.—Interruption in regular steamship service did not check business to any extent. Steady demand was experienced at 8½d. to 9½d. f.o.b. for ordinary eggs, to 9½d. for circle eggs.

Melbourne.—Strong demand for circle eggs up to 10½d. f.o.b. Ordinary eggs 8½d. to 9d. f.o.b.

Western Australia.—Local supplies maintained, so that shipping was not extensive. The business done was at from 8½d. to 9½d. for ordinary ungraded eggs. For circle eggs there was better trade in the Eastern States. The longer journey to Fremantle operated against shipment to a considerable extent.

BUTTER.

Cream has been coming in well, and the demand for butter is increasing, and in both manufacturing and sales there is a decided advance on the same period last year. Prices have been steadily rising, and the quality of the butter has been satisfactorily maintained, despite the spells of warm weather. The market quotations of to-day are, superfine 1s. 2d., and creamery 1s. 1d.

Messrs. A. W. Sandford & Co. report on February 1st:—

FLOUR.—City brands, £10; country, £9 15s., per ton of 2,000lbs.

BRAN.—1s. 0½d.

POLLARD.—1s. 1½d. per bushel of 20lbs.

OATS.—Local Algerians, 1s. 8d. to 1s. 9d. per bushel of 40lbs.

BARLEY.—Cape, new, 2s. 3d. to 2s. 4d. per bushel of 50lbs.

CHAFF.—£3 2s. 6d. to £3 5s., Port Adelaide, per ton of 2,240lbs.

POTATOES.—New locals, £4 to £5 per ton of 2,240lbs.

ONIONS.—New locals, £4 per ton of 2,240lbs.

BUTTER.—Factory and creamery, fresh in prints, 1s. 0½d. to 1s. 2d.; choice separators, dairies to second grade factories, 11½d. to 1s. 0½d.; weather-affected factory and creamery, 9½d. to 10d.; medium quality separators and dairies, 8d. to 9d.; stores and collectors, 6d. to 8½d., according to condition and quality.

CHEESE.—Factory makes, 5d. to 6d. for large to loaf, new make; matured, 7d. to 7½d. per lb.

BACON.—Factory-cured sides, 8d. to 9d. per lb.

HAMS.—In calico, 10d. per lb.

EGGS.—Loose, 8½d. per dozen.

LARD.—Skins, 6½d.; tins or bulk cases, 6d. per lb.

HONEY.—Prime clear extracted, 2½d. per lb.; dark and ill-flavored, 1d. to 1½d.; beeswax, 11½d. per lb.

ALMONDS.—(Scarce) soft shells, Brandis, 7d.; mixed soft shells, 6d.; kernels, 1s. 4d. per lb.

LIVE POULTRY.—Good table roosters, 2s. 6d. to 3s. each; light cockerels, 1s. 3d. to 2s. hens, 1s. 3d. to 1s. 8d.; ducks, 1s. 3d. to 2s. 5d., for medium to good; geese, 2s. 3d. to 3s. pigeons, 4d.; turkeys, 8d. to 9d. per lb. live weight, for fair quality; no prime offering fattening sorts, 4½d. to 5½d.

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Feb.	Mar.			Feb.	Mar.
Amyton	*	—	—	Meningie	*	19	26
Angaston	*	19	26	Merghiny	*	—	—
Appila-Yarrowie	*	—	—	Millicent	*	8	8
Arden Vale & Wyacca	*	—	—	Miltalie	*	5	5
Arthurton	*	—	—	Minlaton	*	—	—
Balaklava	*	—	—	Moonta	*	—	—
Beetaloo Valley	*	—	—	Morchart	620	—	—
Belalie North	*	19	19	Morgan	*	—	—
Bowhill	*	—	—	Morphett Vale	†	—	—
Brinkworth	*	22	22	Mount Bryan	*	—	—
Bute	*	22	22	Mount Bryan East	*	5	5
Butler	*	—	—	Mount Gambier	628	12	—
Caltowie	*	21	21	Mount Pleasant	*	11	11
Carrieton	*	24	24	Mount Remarkable	*	24	24
Cherry Gardens	625	22	22	Mundoora	*	—	—
Clare	622	18	25	Nantawarra	*	23	23
Clarendon	*	21	21	Naracoorte	*	12	12
Colton	*	26	26	Narryd	*	26	—
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Coonalpyn	*	—	—	Orroroo	*	—	—
Cradock	*	—	—	Parrakie	*	5	5
Crystal Brook	*	—	—	Paskeville	*	19	26
Cummins	†	19	26	Fenola	*	12	12
Davenport	*	—	—	Penong	*	12	12
Dawson	*	—	—	Petina	*	—	—
Dingabledinga	626	11	11	Pine Forest	*	22	22
Dowlingville	*	—	—	Port Broughton	†	18	25
Forest Range	*	24	24	Port Elliot	*	19	19
Forster	*	—	—	Port Germien	*	—	—
Fowler Bay	*	19	19	Port Pirie	622	5	—
Frances	*	—	—	Quorn	*	—	—
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Georgetown	*	26	26	Rhine Villa	*	—	—
Geranium	*	26	26	Riverton	*	19	26
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Hartley	626	19	26	Smoky Bay	*	—	—
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Koppio	624	—	—	Whyte-Yarcowie	*	—	—
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Longwood	625	19	23	Wilmington	620	24	24
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Maitland	*	5	5	Yallunda	*	—	—
Mallala	*	5	7	Yongala Vale	*	—	10
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Meadows	*	—	—				

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD.)

Coomooree, January 24.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Berryman (chair), J. and Jer. Brown, Brice, Polden, Ward, H. and M. Robertson, and Kildea (Hon. Sec.).

BUNT TESTS.—Considerable discussion took place on the experiments conducted at the Parafield Experiment Station with various preparations for the prevention of bunt. One member expressed his intention of trying some fungusine this year. Arrangements were to be made to purchase bluestone in bulk from the factory, and over 100wt. was bespoken in the room.

HARVESTERS.—The question as to which make of harvester would do the work best was discussed, and the McCormick, Federal, and Sunshine makes came in for comment. The two last were particularly highly spoken of, and members generally were of opinion that the harvester was the best machine to use. A few, however, still used the stripper on account of the necessity to save the cocky chaff.

Morchard, November 20.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Scriven (chair), Kupke, Loftes, Kirkland, Munro, Jasper, Reichstein, and McDougall (Hon. Sec.).

HAY-MAKING.—Mr. Kupke read a paper on "Hay-growing and Hay-making." He would not wait till the grain formed before cutting for hay, as this allowed the straw to become dry and white. If, however, it was desired to have a fair proportion of grain in the chaff it was a good plan to sow white oats with the wheat. He sowed about 55lbs. of wheat and 15lbs. oats for hay, and favored among other wheats Baroota Wonder, Dart's Imperial, Majestic, and Purple Straw. In his opinion it paid to roll land intended for hay-growing. Not only was it better for the binder to work on, but the hay could be cut an inch or two nearer the ground than on rougher soil. This meant 3ewts. to 5ewts. more hay per acre, and on 50 acres worked out to-day at about £20, a sum which would more than pay for rolling, and the wear and tear of the binder would be reduced considerably. Sheaves should be made a fair size, say, not less than 10lbs. weight, to reduce the handling as much as possible. Carting should be commenced immediately the hay was dry enough. Every day in the field after that reduced the value and weight of it. Stacking should be accomplished as speedily as possible, and the stack should be kept very high in the middle. Stacking with the butts out a better shape could be made, and the sheaves were less likely to slip in dry weather. He liked to build a stack from 18ft. to 20ft. wide. If salt were used, he would advise applying that of good quality, and would put a little over every layer of sheaves. Salted hay was better than other for chaffing in damp weather, and the horses preferred it. Horses also preferred chaff that had been cut damp, and the cutting was better for the men if the hay were in that condition. In the discussion which followed, members were all of opinion that land for hay should be rolled, and that salt should be added to the hay when stacking. They also considered that stacks should not be built too wide, as it was easier to keep the wet out of a narrow stack. Some favored sowing oats and wheat mixed, and preferred to cut it when fairly green if it was to be fed long.

Wilmington, January 20.

(Average annual rainfall, 17½in.)

PRESENT.—Messrs. Slee (chair), Hannigan, Farrell, J. and G. Schippan, Scholefield, Noll, Robertson, Payne, and Jericho (Hon. Sec.).

PREPARATION OF LAND FOR CROPS—Mr. Farrell read a paper on this subject as follows:—“Farming has gone forward during recent years, and now the man who would be successful and get the greatest return from his land must experiment. It is of no use to go on with one

method or practice when perhaps another will give a greater return. The farmer must find out what his soil is in need of and provide it. I like to fallow early in the winter, although it entails more work in keeping the weeds down. Fallowing is the means whereby we conserve the moisture in the soil, so it is very necessary to break the soil up in the early winter, and give the rain every chance to get well down. I would plough to a depth of, say, 5in.; some land will stand more, and some not so much where the clay is close to the surface. This fallow should later on be well harrowed, for preference after rain, so as to break all lumps and secure a nice surface tilth. Some soils if left in this state after rain will run together, and bake very hard and firm. It is essential that this should be at once broken up with the scarifier. All the land should be cultivated as soon as the weeds show, and then be kept clean. A few sheep will be found of great assistance in keeping fallow clean, but cultivation must assist them. The surface must be kept down to a nice tilth, and not be allowed to crack in the summer, so as to keep the moisture which is already in the ground. On country that is subject to drift it is not advisable to have the surface too fine, but for local farm land I think it a very important factor in wheat culture. It is recognised that no soil holds moisture so well as a sandy one, and this, I think, proves that the finer the surface the less chance of moisture escaping. Some may think summer working is injurious to the coming crop, but there is no necessity to work deeply, and the harrows will do all that is needed. I am not an advocate of late seeding, but I would never countenance very early sowing. If seeding is delayed till after rain the weeds will have sprouted, and it will be possible to destroy them. I have seen many a paddock of wheat spoiled through sowing in dirty ground before the rain. Until rain falls the grain can do no good in the ground; it cannot grow, and there is the risk of malting. If a farmer has fallow he will have plenty of time to put in his crop after rain comes, and thus be able to clean the land and get a better return for what he sows. The crop will also look well. No wheat should be sown without first pickling. I would sow 1bush. of seed to the acre. In regard to manure every farmer must use that which suits his land best, and this he can only find out by experimenting. Harrowing a growing crop I have not tried, but believe it is sometimes beneficial, more particularly if done just before rain. I believe in rolling for this district. "The land is much better for the machinery, and I think it retards evaporation." In discussing the question of pickling seed wheat members agreed that the best proportion of bluestone to use was $\frac{1}{2}$ lb. to 4bush. of seed. They advocated the use of a stronger solution than this if the seed was smutty.

Wirrabara, January 15.

(Average annual rainfall, 30in.)

PRESENT.—MESSRS. J. Lawson (chair), Lomman, Curnow, Kendrick, W., W. H., and E. J. Stevens, Marmer, H. E. and A. Woodlands, Blesing, C and J. Hollett, Hoskins, Pitman, and H. Lawson (Hon. Sec.).

FROZEN LAMB EXPORT TRADE.—Mr. Kendrick read a paper on this subject. He believed he was the oldest and largest lamb-buyer in the State, and in his opinion the frozen meat trade of South Australia was still in its infancy. Whereas 16 years ago few farmers kept sheep, to-day most of them looked for a "lamb cheque" each year. This change had been partly caused by the coming of fertilisers and the cutting up of large estates. To enter upon the lamb-raising business, a farmer should form the foundation of his flock by purchasing large-framed ewes, from two to three years old, with good constitutions. "Never attempt to breed export lambs from two-tooth ewes," the paper continued; "let them mature before being asked to mother a lamb. Milk is the main factor, and a two-tooth ewe cannot produce such quantity and quality of milk as can a four or six-tooth ewe. Buy the best rams possible. Avoid aged sires, for the success of the lambing largely depends on the sire, and without youth vigor is impossible. The grower will do well to watch the ewes and lambs in wet weather, and also when the young grass begins to show above ground. Breeding ewes going from dry feed on to green grass are apt to scour, and if not kept properly cleansed, will be in such a dirty state around the breech and udder that the lamb will wean itself. I saw thousands of both ewes and lambs in a dirty condition on the Peninsula last season, and although the lambs were well grown they were far from being fat, and consequently could not be purchased by buyers. A well-grown lamb is not necessarily fat. If found to be fat across the loins and on the dock, the other parts will be good also." Members were warned not to send inferior lambs to the freezers, as they were rejected in such numbers that it was difficult to dispose of them, and ridiculously low prices had to be accepted. Reference was made to the New Zealand lamb trade, and the opinion expressed that the Government here would do well to appoint an expert to give practical lectures and demonstrations throughout lamb-raising districts of South Australia. "While we have experts," he said, "for honey, eggs, butter, wine, fruit, and chickens, the sheep and lambs, that furnish the golden fleece and meat for thousands, go neglected." [The writer of the paper

evidently has overlooked the fact that there is a Government wool expert, who lectures on sheep-breeding among other subjects, and lamb-breeding for export is not neglected.—Ed.] Farmers were strongly advised to build yards for displaying lambs for sale, as a buyer would be prepared to give a much better price for animals which he had examined than he would for those he had only seen rounded up in a corner of a paddock.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Port Pirie, January 15.

(Average annual rainfall, 12½in.)

PRESENT.—Messrs. Hawkins (chair), Johns, Munday, Bell, Noll, Welch, Greig, Eagle, Simpson, Teague, Jose, and Wright (Hon. Sec.)

Co-operation—Mr. Munday read a paper on “Co-operation among Farmers.” He was strongly in favor of the principle on which existing farmers’ co-operative unions were based, but the trouble was that only a small proportion of the farmers identified themselves with these societies, and those who were members did not deal as exclusively with them as might be. There were so many combinations among middlemen that the producers were bound to suffer unless they united for their mutual benefit. The extent to which co-operation could benefit the farmer was very great. The output of products could be so regulated as to avoid a glut in the market. Machinery, implements, stock, &c., could be purchased at lower rates, and for the use of a number of farmers expensive machinery that would be beyond the scope of the individual could be procured. In order that the producers’ interests might be protected and a fair return for his labors be assured he strongly advocated hearty co-operation among farmers. In the discussion which followed it was considered that, while the principle of co-operation was sound, the chief difficulty lay in procuring the services of a thoroughly competent manager. The other points touched upon in the paper were generally agreed to, and it was stated that, whereas a few years ago the price of wheat at Port Pirie was 4d. a bushel below that of Port Adelaide, owing largely to the South Australian Farmers’ Union there was now very little difference in the prices paid at the two ports.

ANNUAL REPORT.—The Hon. Secretary read his annual report, and altogether it was of an encouraging nature. The average attendance at meetings had been over 11 members. Papers on the following subjects had been discussed:—“Notes on the Harvest,” “Breeding Lambs for Export,” “Advantages of Fodder-growing,” “Horse-breeding: will it Pay?” “Advantages of Bureau Membership,” “General Farm Management,” “Sheep for the Farm,” and “The Treatment of Drift Lands.”

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Clare, December 21.

(Average annual rainfall, 24in.)

PRESENT.—Messrs. McCarthy (chair), Forbes, Bowman, Lockyer, Victorsen, Walker, Nolan, Miller, Kempster, Keane, Pryor, Irvine, Jarman, J. H. Knappstein, Radford, Kelly, Kollosche, Scales, and P. H. Knappstein (Hon. Sec.).

DEEP PLOUGHING BETWEEN VINES.—Mr. Walker read a paper on this subject as follows:—“It is an important point as to whether vines renew their roots when they are damaged in the same way as they put fresh shoots on their branches when a limb is severed. If fresh roots are

thrown out by the plant no harm might result from deep ploughing, as the vine would be induced to throw out roots at a deeper level where probably more moisture was obtainable. On the other hand, the root, if severed, might, instead of forming one main root, throw out a bunch of small ones. These small roots might not penetrate the same distance or depth as the one severed, and for some time at least their power of supplying moisture and plant food would be less, and the vitality of the vine would be affected. It is questionable, even after a considerable lapse of time, if this bunch of roots would perform its functions as satisfactorily as the original root. It has been long held by authorities that a vine planted as a cutting is more robust than one planted as a rootling. In the case of the latter the roots, which were necessarily cut back on transplanting, would throw out a less normal system than that provided by the original cutting. In the natural reproduction of the parent plant the root system of the vine is made up of two groups—surface feeders, which absorb the bulk of the food substances, mainly at the early period of the growth; and deep roots, which supply the moisture to the vine in dry weather. Probably in dry districts the vine adapts itself to the climate, and in searching for moisture throws its roots deeper. As regards damage to roots, it is a well-known fact that one of the first effects of phylloxera is to cause the vine to yield heavy crops. In the first stages of invasion this might possibly be an argument in favor of deep ploughing, and so cutting the surface roots, but time alone would show if it affected the vines to any material extent. In the majority of our soils the surface is richer than the subsoil both in nitrogen and phosphoric acid. Abundance of the firstnamed would tend to promote active growth in surface roots. G. Foex, in his 'Manual of Modern Viticulture,' writes—'The first ploughing should be the deepest. In certain countries it is down to a depth of 6in. to 9in.; it should allow the access of air as deeply as possible, and also allow the water to penetrate and be retained in the subsoil.' Some viticulturists, however, condemn, in a general way, deep ploughing for vines. They are of opinion that the destruction of superficial roots, which play an important part in the nutrition of the plant, greatly injures its growth, but it must not be forgotten that in very dry countries, which are those requiring deep cultivation, the superficial root system is not found near the surface, for the amount of humidity there is not sufficient to ensure their development, or because after having grown under the influence of spring rains they dry and die under the influence of the summer drought. Therefore, it is in climates where soils naturally keep moist that shallow first ploughing can be advocated." Mr. Jarman said that a lot of his vines were planted and never ploughed below 4in., and now it was a great task to do the ploughing, as the surface roots choked the plough. He thought that if the surface roots were encouraged to go down by ploughing deeply right from the time of planting it would be beneficial. He also gave instances of how deeply they plough the vineyard at Roseworthy College. Mr. Knappstein said that the depth of ploughing should be varied according to local conditions. Deep ploughing was best where practicable. He gave instances of how deep they plough the vineyards in Bordeaux, sometimes going to a depth of 12in. Mr. Victorsen could not plough more than 3in. in parts of his vineyard, and found that the vines were doing well in those particular places. Mr. Nolan asked, if the vineyards were always ploughed deeply, would not the top surface soil be useless, as the roots would not be allowed to penetrate there? The members thought that the action of sun and rain on the top soil promoted chemical action and thus made food for the roots below. Mr. McCarthy was in favor of deep ploughing because the vineyards were always easier to cultivate afterwards.

Freeling.

(Average annual rainfall, 17½in.)

PRESENT.—MESSRS. A. Mattiske (chair), A. Mattiske, jun., Shanahan, Heinrich, Nenke, Neldner, Power, Koch, Neindorf, Keane, H. Mattiske, Steinfeldt, Bayley, Peters, Block (Hon. Sec.), and two visitors.

PROGRESS IN AGRICULTURE.—The Hon. Secretary read a paper describing in an interesting way the circumstances leading to the invention and introduction of the stump-jump plough and other farm implements. The invention of the stripper and its subsequent evolution into the complete harvester was also referred to. Members were reminded that the stump-jump plough and the stripper were invented by South Australian farmers, although now improved almost beyond recognition. He considered that these implements and machines, including the seed drill and others, were only a forecast of what was to come. Agricultural colleges for the equipment of prospective farmers, bureau meetings, and the enterprise of the men on the land all helped towards this continued progress, and he believed the next fifty years would be just as full of progress for the farmer as had been the last half century.

Gawler River, January 21.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Roediger (chair), A. and F. Bray, Hillier, Richter, Davis, H. and A. M. Dawkins, Leak, Winckel (Hon. Sec.), and three visitors.

HEAVY LOADS AND BAD ROADS.—Mr. Bray spoke on the above subject, and referred to the practice in New Zealand of licensing vehicles. He mentioned that in some countries the charges were higher on light vehicles than on heavy ones. He was of opinion that the loads carried on the local roads were too heavy. Carters, he said, should use a little discretion when roads were new, instead of going straight through the new metal. Mr. Davis considered that a fair load could be carried on wide tires without damaging the roads to the extent that narrow tires did. The Tire Act was frequently disregarded. Mr. Richter was of opinion that it would be wise to stay at home in the wettest weather. The horses would benefit by the spell, and the roads would be saved. Mr. Winckel said that roads were built to carry a certain load, and going over the limit would sometimes break right through and ruin them. This Branch thought there was need for more supervision and enforcement of the conditions of the Tire Act, and that district councils and corporations should be more strict in regard to this matter.

Salisbury, January 4th.

PRESENT.—Messrs. Moss (chair), Richardson, Kuhlmann, J. and A. H. Harvey, Urlwin, McNichol, Laurie, Allington, Jenkins (Hon. Sec.), and three visitors.

LESSONS FROM THE HARVEST.—Mr. Richardson gave an address on this subject. Illustrations were given showing the benefit of working the surface of the soil to a fine state to retard evaporation. Superphosphate was practically the only commercial manure necessary to apply to the soil for cereal-growing in this district, and Federation, Yandilla King, and Baroda Wonder were the most suitable wheats. The use of formalin as a bunt preventive instead of bluestone was recommended as being less detrimental to germination. A general discussion followed.

WESTERN DISTRICT.**Koppio, January 20.**

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), G. B. F., and M. Gardiner, Brenand, Thompson, Newell, F. and R. Richardson (Hon. Sec.), and one visitor.

WHEAT SAMPLES.—Two samples of wheat were tabled. World's Champion was a very fine sample of large grain. Federation, taken from a 30bush. crop, was not so good as the former. The grain was smaller and not filled so well.

EXPERIMENTAL WHEAT PLOTS.—Mr. Newell reported that the yields from the wheat plots under his supervision were poor this year. A great deal of damage was done in November by hot winds. The best wheat seemed to be Federation, and this variety yielded an average of 15bush. in three years. Yandilla King returned an average of 12bush. and Majestic 11bush. 9lbs. per acre. Mr. Newell, having decided to give up the supervision of the experiments, was thanked by the Branch for his services, and Mr. Brenand undertook to take up this work.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Lameroo, November 27.

(Average annual rainfall, 16in.)

PRESENT.—Messrs F. W. Eime (chair), McMahon, Wittwer, White, Needs, Skinner, Gibbons, Dods, W. J., E. J., and S. G. Trowbridge, Bowen, Leckie, Wray, Perkins, Dunstone, Ross, Walsh, Hannan, C. R. Eime, Tyler, R. B. and A. J. A. Koch (Hon. Sec.), and six visitors.

STRIPPER v. HARVESTER.—Messrs. Wittwer and Trowbridge read papers on this subject. The former considered that on land which was not too sandy a man without grown sons would do best with the harvester if dealing with up to 250 acres of crop. The loss of the cocky chaff he realised was rather a serious matter in this new district, and the redistributing of seeds of weeds had also to be remembered. Where a farmer had up to 1,000 acres to deal with the best way to harvest would be with strippers and a motor winnower. The motor would be of use for other farm work from time to time. This method would cost less to work than complete harvesters, as with the latter expert men were needed, and more horses than for the strippers. It was also an advantage to be able to start work a little earlier with the stripper, and this was quite safe, as any wheat not quite ripe would ripen in the heap. He would therefore recommend the complete harvester for small farms, but for large crops of wheat strippers and a motor winnower were best. Mr. Trowbridge preferred the harvester because the crop could be taken off much more quickly than with the stripper, owing to the necessity for driving to the heap when the latter machine was used. The harvester also put more wheat into the bag than it was possible to get with the stripper, and the saving of labor was perhaps the most important point of all. One man with five horses could harvest 250 acres of crop in less than four weeks if good weather prevailed, and when the harvesting was over carting could be commenced at once. In the event of harvesting being suspended for a day or two the opportunity could be taken to cart wheat to market. He had used the harvesters for two seasons and had never used more than four horses on the machine. Fully two-thirds of his crop had been taken off in this way, although an ordinary stripper was working on the crop at the same time. The harvester would make a good clean sample, and would not waste much wheat if carefully worked. On most of the land in this district the harvester could be satisfactorily worked, but it did not do very well on big sandhills. The machines dealt with in the two papers were well discussed, and the majority of those present favored the use of the complete harvester.

Wilkawatt, December 17th.

PRESENT.—Messrs. W. Bowman (chair), Harvey, Twining, Kernich, D. Bowman, Ahrns, H. H. and E. W. Brooker, Altus, Ivett, T. and C. Sorrell, Neville, Short (Hon. Sec.), and two visitors.

FARMING IN MALLEE DISTRICTS.—Mr. Kernich gave a short address on farming in districts similar to this. He considered that scrub land intended for cropping the following year should be rolled down not later than September. Spring-backs should then be cut, and a good substantial break cleared ready for burning. He would not burn until ready to work the land, and then would use a scarifier, disc cultivator, or similar light implement. It was preferable to plough, but the lighter cultivator would cover more ground per day, and for the first crop would give a fair return. For land that had been burnt with the mallee standing, he advised ploughing before sowing. Mr. Harvey described the way in which he had fixed a piece of jarrah on the back of the stripper—just sweeping the ground—to break the stubble down. Members thought it would be best to fix such a contrivance to the axle.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, December 20.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. A. and T. Jacobs, C. and J. Lewis, Ricks, Chapman, Stone, Strange, Kayser, Curnow (Hon. Sec.), J. W. Sandford (Chairman Advisory Board), and one other visitor.

ANNUAL MEETING—The Hon. Secretary reported on the year just closed. This had proved to be the most successful year in the history of the Branch. Thirteen meetings had been held, with an average attendance of 10½ per meeting. Seven papers had been read and discussed, and altogether 28 visitors attended meetings. Among the subjects discussed were—Conservation of timber, summer fodders, poultry egg-preserving, pig-raising, bacon-curing, useful indigenous insectivorous birds, co-operation, cultivation and mulching of soils, apple export, cows, and wattle culture.

Dingabledinga, January 14.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. Trumper (chair), Allen, A. F. and Felix De Caux, McMurtie, and Chenoweth (Hon. Sec.).

CLEARING TIMBERED LAND.—Mr. De Caux read a paper on the question of how best to deal with the heavily-timbered land of the district. At the outset he deprecated the practice of slaughtering valuable timber wholesale, and then described the best manner of clearing various timber trees where necessary. To kill stringy bark or large red gum and allow the grass to grow he would ring the trees in the winter. For smaller red gum, bastard gum and blue gum he would cut the trees off knee high and turn sheep in to eat of the shoots later. The sheep would keep at the shoots and so kill the stumps. To kill honeysuckle he advised cutting down in the winter when feed was scarce. Sheep and castle would then feed on it. Properly treated, this wood made the best charcoal for silversmiths' use. It was also a magnificent firewood. To clear for cultivation he would grub the trees out in the winter with the aid of a forest devil or by means of dynamite; then chop the limbs so that the tree would lie flat on the ground, where it should be left through at least one summer. If left for two seasons so much the better. In March a sufficiently good fire to burn all the timber should be obtained, but a windy day must be chosen for it. In the discussion which followed members were of opinion that sheep would eat sand gum in preference to red gum. It was also considered unwise to leave stringybark trees growing unless in clumps, as they seeded too freely. The best time to ring stringybark was said to be January or February. Care should be taken when burning not to have a big fire, as that caused so many seedlings to spring up. The lack of transport facilities to populated centres made the cost of clearing very great. All timber cut down had to be burnt.

Hartley, January 22.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Wundersitz (chair), Tydeman, Brook, Phillips, and Birmingham (Hon. Sec.).

HARVEST REPORTS.—Members reported much better yields in wheat than had been expected. Federation, Yandilla King, Purple Straw, and Marshall's wheats were considered the best varieties for the district. Federation yielded up to 28bush. per acre. The Chairman said he had reaped five bags of oats before dinner and only two after. The day was hot and windy, the result being that a great deal of grain was shaken out. Other members had had similar experiences with oats.

MAGPIES.—It was considered by this Branch that magpies should not be protected, as they did more damage to young wheat crops than any other bird. Members wished to know whether it was lawful to kill this bird when in the act of pulling up the crop. [It is not lawful to kill a totally protected bird or animal under any circumstances.—*Ed.*]

WEEVIL.—The Chairman wished to know how to destroy weevil in hay chaff. [If the shed containing the chaff can be made fairly airtight the use of bisulphide of carbon will prove effective in destroying the weevils. As the fumes of this are poisonous, and exposure to a naked light will result in an explosion, considerable care must be exercised in handling the bisulphide.—*Ed.*]

Longwood, December 18.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. W. Nicholls (chair), J. Nicholls, Vogel, Pritchard, Glyde, Hughes, Oinn, Coles (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Vogel. Members inspected the garden, and a general discussion on spraying took place. It was considered that fungus troubles could be overcome and prevented by the use of Bordeaux mixture, and the recipe given was 2lbs. washing soda to 1lb. of bluestone. [Is this not intended for "Burgundy" mixture, which is made in the proportions of 6lbs. bluestone and 9lbs. washing soda to 50galls. to 60galls. of water? It is made up in the same manner as the Bordeaux mixture, but possesses an advantage in running easily through the nozzles, and the constituents may be procured at any time without fear of deterioration from keeping. Bordeaux mixture is made with lime and sulphate of copper.—*Ed.*] It was stated that poor results had been obtained from spraying on account of insufficient force in spray pumps, and that pumps should be capable of generating a pressure of 150lbs. to the square inch. A pear tree of rather poor appearance called forth some discussion, and one member deprecated grafting pears on quince stocks. Fodder plants, which came in for favorable comment, were "cow-grass" and *Trifolium pratense*.

grown with oats. The oats afford protection from frost, and the two plants grow up together making a good hay crop. *Trifolium subterraneum* was spoken of as a valuable pasture. Members were of opinion that many grasses introduced here some time ago had improved in quality and feed value on becoming acclimatised. After being entertained at tea by Mrs. Vogel the business of the day was transacted. Apples and cherries were tabled. Shothole fungus had done a lot of damage to early cherries. Citron de Carme pears were said to be an excellent early variety, ripening usually early in December.

BOTFLIES.—It was reported that botflies were very prevalent this year, and members were advised to wipe over the parts of the horses where the flies usually lay the eggs with a little kerosene on a cloth.

Longwood, January 22.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. Hughes (chair), Pritchard, Furniss, Vogel, Roebuck, Glyde, Nicholls, Oinn, Coles (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Glyde. After inspecting the orchard, containing about 750 trees, members partook of refreshments provided by the host, and the business of the Branch was dealt with.

FOXES.—It was reported that a fox had killed seven fowls without eating any of them. Reynard, however, was destroyed the following night by a sheep dog. Mr. Harslett recommended the following bait for foxes: - Put some strychnine in a hen's egg through a small hole in the end and mix thoroughly with the yolk. Seal the hole with a piece of eggshell secured with some white of egg and place the bait in some convenient spot.

CODLIN MOTH.—Members who had used desparine reported the presence of the codlin moth in their gardens. Mr. Furniss, who had sprayed twice with Nicholl's arsenate of lead, costing 10d. for 50galls., had scarcely 1 per cent. of wormy apples up to the present.

SAMPLES OF FRUIT TABLED.—Exhibited on the table were 11 varieties of plums, among which was Angelina Burdett, a similar plum to Prince Englebret, and a damson, known by some members as "Shropshire." Eight varieties of apples were also shown, and among them was a Strumer Pippin affected with some disease. The application of Bordeaux mixture had apparently no effect on the pest.

SWEET POTATOES.—Members wished to know how to grow sweet potatoes.

SOUTH-EAST DISTRICT.

Kalangadoo, January 10.

PRESENT.—Messrs. Crouch (chair), Guerin, Vorwerk, Hon. G. Riddoch, Tucker, Gibb, Ellison, Boyce, and Sudholz (Hon. Sec.).

DRAKE.—Some discussion on the prevalence and origin of this weed took place, and the Hon. Secretary read from the secretary to the Advisory Board a letter in reply to a question of this Branch to the effect that drake, or darnel, is a distinct variety of plant—one of the *Loliaceae*, to which family both classes of rye grass belong. The opinion is expressed by some farmers that it is a deteriorated form of wheat plant; but this, however, is without foundation, and it could easily be tested. Let a member take a quantity of soil and roast it to destroy any seeds that may be in it, and then put it into pots with proper drainage. Sow a seed of wheat in each of a number of pots, and one seed of drake in each of a number of others, and it will be found, if the soil has been properly sterilised to kill any drake seeds that may be in it, that the wheat will always produce wheat and drake drake. One reason why (especially in cold districts, and land that has a tendency to be cold and wet) at times the drake appears to take the place of wheat is that drake will thrive on wet and cold land under conditions in which wheat may die right out, or at any rate make so little growth that the other plant will choke it, and consequently when the crop comes to be reaped the greater part of it is drake." Mr. R. Boyce offered to experiment with plots of wheat and drake for the information of members.

VISIT TO KRYBOLITE EXPERIMENT FARM.—Members of this Branch with those from other Branches made up a party of about 50 and visited this farm on November 26th. Much interest was taken in the implements, crops, and stock, as well as the general methods of management in evidence. The experimental orchard and the poultry experiment station were also inspected, and a profitable time was spent.

Mount Gambier, January 8.(Average annual rainfall, 31 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Sasanowsky (Chair), Edwards, Schlegel, Engelbrecht, Smith, Keegan, Boddy, Rawoldt, Niquet, Holloway, Innes, Kilsby, Watson, G. and D. Collins (Hon. Sec.).

POTATO-GROWING.—Members reported on experiments being conducted for the Department of Agriculture. Mr. Niquet had planted 107lbs. of May Queen, and all he dug was 38lbs. The damage they sustained was from the wind. There was a terrible lot of wind in the season. There was not one marketable potato in the lot. They were planted on the north side of a hill. Of Ruby Queen he planted 41lbs and dug 33lbs. Duke of York was a complete failure: he planted 33lbs. and dug only 14lbs. He planted 86lbs. of "Challenge" and dug 16lbs. The tubers grown were small; some were not larger than nutmegs. Of medium season potatoes he had Klondyke, Challenge, and Royal Kidney. The last seemed to have grown the best. He planted a few of the Duke of York in his garden in good soil, and manured them, and they did no better than those planted on the hillside. He could not say whether they would do better another year when acclimatised. Mr. Kilsby's report was as follows:—"The change of seed from Melbourne has been very satisfactory. They were planted in the third week of September in black loam (Moorak land). I planted the four bags of Snowflakes and put the same quantity of local seed alongside, and by the appearance of the crop at present the imported seed will yield about double the crop of the local. The Brown's Rivers look equally well. The manured plots were started on October 9th, and are growing very satisfactorily." Mr. Smith reported that in his plots the Carmens were put in during the second week of August. They came up well, and looked splendid right through. They were all manured with superphosphate and potash and blood manure excepting two rows, which were left unmanured as a test. The manured potatoes came up more quickly than the others, and showed a difference right through, but now they had finished their growth the difference was less noticeable. He thought the yield of Carmens would go between 2 tons and 3 tons to the acre. That would be good for the paddock they were in. He had one bag of Snowflakes, and planted them the second week in October alongside some local seed that he grew himself. He thought that when dug they would yield two or three times as much as the local seed. In future he would not put in a large quantity unless he had a change of seed. Mr. Engelbrecht had three quarter-acre blocks that had not been cultivated for ten or twelve years. He planted the potatoes between the 8th and 10th of September. For the Warriors he put on the land 20 lbs/ads of stable manure per acre. The second plot was not manured. The third had blood manure and super, or sulphate of ammonia applied to it. Up to the present time they were a partial failure right through. Quite one-third of them missed. He paid twice as much for them as for ordinary seed, and they were carefully planted. They were planted 6in. deep. They seemed very good above ground, but had very little underneath. In order to strengthen the test he put in a quarter of an acre of Redskins without manure, and that was worse still. There were more misses in it. Six acres of late potatoes stood up like a wall. Mr. Ruwoldt planted in the third week of October, and the plants grew up splendidly. The plot that had no manure came up the best. Mr. Edwards said there were magnificent potatoes in his paddock at O.B. Flat, where the ploughing match was held. They were Snowflakes from Glencoe, and the fact that they had grown so well showed the value of a change of seed. The Chairman thought the reports generally showed the value of a change of seed.



THE JOURNAL

OF THE



Department of Agriculture

OF SOUTH AUSTRALIA.

No. 8.

MARCH, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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"The Editor, Journal of Agriculture, North Terrace, Adelaide."

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Roseworthy College Seed Wheat.

In order to meet the demand for seed wheat the graders at Roseworthy College have been working at full speed, and consignments have been dispatched as rapidly as possible. Most of the lines have found a very ready sale, many of them in fact having been over-ordered. There is still available, however, first-class clean graded seed of the following varieties at reasonable prices: — King's Red (selection 2), Gluyas (selections 1 and 2), King's White (selection 2), Bearded Gluyas (selection 1), and a small parcel of Jonathan.

Success of Egg Circles.

The Minister of Agriculture has received from Mr. A. E. Kinnear (Organising Secretary of the system of Co-operative Egg Circles), a comprehensive report on the results of the first six months' operations. The movement was initiated with the idea of placing the industry on a satisfactory footing, and of establishing a system of combination among egg-producers that would enable the oversea business with England to be satisfactorily developed. Mr. Kinnear states that in other trades quality is always the basis upon which a successful business is worked up, and this has been the keynote of the success of the egg circles. Work was begun too late to get together a sufficient number of eggs to make a shipment to England; and, moreover, the Australian rates were payable, so that there was no occasion to ship. Mr. Kinnear thereupon set to work to establish a trade in the other States with graded circle eggs, and after much opposition this has been successfully accomplished. Twenty-nine egg circles were established during the six months, and the members have taken such care with the eggs that it has been possible to pay more money in the centres where there are egg circles than was offered by any merchant, store-keeper, or trader. The circle movement, it is further reported, has had a remarkably steady effect on the local market, and a regular sale of eggs in grades in Adelaide, Sydney, and Melbourne has also been established. Considerable opposition was encountered from Adelaide traders, but repeat orders are coming in freely, and the Department has been able to obtain better than the Adelaide market rates by 1d. to 2d. net for No. 1 grade and $\frac{1}{2}$ d. net for No. 2 grade. The biggest and best manufacturers in Sydney and Melbourne are on the Department's books. The report further states that the consumer

has been supplied with a better class of egg, and has received more for his money even at the extra price charged. A new business is not usually expected to show profits the first year, but after making every debit that would be made by a business house, and paying better than the market price for eggs, there was a profit for the six months of £328. Mr. Kinnear has recommended the Minister to approve of the establishment of a city depot, so that eggs may be better and more cheaply handled than at the Port Adelaide depot.

The Harvest at Roseworthy.

The annual report of the harvest on the Roseworthy College Farm, of which the first part is published in this issue, is the joint production of Professor Perkins and Mr. W. J. Colebatch (the Acting Principal). Owing to the season being unusually late harvesting was not completed when Professor Perkins had to leave for Europe, and the report which he began was finished by Mr. Colebatch. The second part, which deals with the wheat harvest, will be published next month. It shows that for the first time the general average of the crops on the farm reached the high-water mark of 25bush., a very fine result on land which is admittedly inferior. Mr. Colebatch reports that the students deserve praise for the manner in which they bore the strain of the heavy harvesting work.

Agricultural Work in the South-East.

In the early part of March Mr. W. J. Colebatch (Superintendent of Agriculture in the South-East) visited the Mount Gambier and Millicent districts for the purposes of selecting five-acre fields in these districts for experimental work. He proposes to conduct manurial and variety tests for the first season. He is also endeavoring to make arrangements for the testing of potato seed prepared in the open, that is, in the usual farmers' style as against selected seed properly sprouted in trays under cover. On the Kybybolite Farm there is available for seed purposes about 400 bags of Algerian oats and 50 bags of Dun oats; also 80 bags of Federation wheat. The oats are twice cleaned and graded, and the wheat is a first-class sample. The Algerian oats are available at 2s. 6d., Dun oats at 2s. 3d., and Federation wheat at 5s. per bushel, on trucks at Kybybolite.

Exportation of Potatoes to Western Australia.

The Horticultural Instructor (Mr. G. Quinn) writes—"Communications have passed between the Departments of Agriculture of South Australia and Western Australia in reference to the admission of potatoes from South Australia

into the western State. Owing to the fact that in South Australia no legislative powers are given to quarantine areas in which the Irish potato blight exists, the Government of Western Australia have decided not to admit South Australian grown potatoes into their State."

Possibilities of the Egg Trade.

In his report to the Minister on the possibilities of the egg trade under the egg circles system, Mr. Kinnear (Organising Secretary), states—"The climate of South Australia is admirably adapted for the production of eggs. At present it is estimated that the annual value is £500,000, of which about 25 per cent. is exportable surplus. Within the last two or three years the people have awakened to the financial possibilities in good fowls properly handled, and in my opinion it only needs the stimulus of 'more money for eggs' to cause a big increase in production. The egg circles have supplied that stimulus—we are already paying our members better money than anyone else—and the prospects point to a big expansion. The formation of fresh circles has been stopped, pending the completion of harvesting operations, but shortly the Poultry Expert will begin a vigorous campaign in the country. Big circles are expected to form at Balaklava, Sedan, Minlaton, and other centres. Several circle members are adding to their plant and flocks, and appearances denote that next year will see a very large number of eggs handled by the circles. The rent paid to the Produce Department for packing and storing accommodation is already a handsome item. It should be doubled next season, and employment provided for 20 or 30 men as testers and packers. The improvement in quality, which is the main plank of the circles system, will no doubt stimulate the local demand for eggs, and altogether the prospects ahead of the movement in South Australia are most encouraging."

Curculio Beetle in the South-East.

"Mr. R. Fowler, of Coonawarra, who acts as inspector of orchards and gardens in the South-Eastern district, has reported to the Department," writes the Horticultural Instructor (Mr. G. Quinn), "that the Curculio beetle (*Otiorrhynchus cribricollis*) has become particularly injurious during the present season. Last year it almost defoliated many of the apple trees in full bearing at Coonawarra, and various remedies were tried by the growers, the chief being tying bandages of sheepskins with the wool attached around the stem of the tree, spraying with arsenate of lead, and allowing poultry to run at large in the orchard. The sheepskin bandage, so long as the wool remained dry,

entangled thousands of the pests, owing to the sharp hooks which form the termination of the tarsel joints of their feet becoming fastened in the wool. The spraying appeared to check the insects up till the time the fruit began to ripen, when attention was directed to harvesting the crop, and the pests got a free hand. The poultry were of considerable value, but, unfortunately, unless they were accustomed to the local conditions, the foxes played havoc with them. Mr. Fowler states that this season the pest is worse than ever in some orchards, and he has been directed to experiment with different poisonous sprays, and any other method which might suggest itself to him of preventing the insects from crawling up the stems of the trees. It is difficult to understand why the poisonous spray has not proved thoroughly effective where its use has been persisted in, and it is possible that the strength of the mixture has been at fault. I myself have used Swift's arsenate of lead, 1lb. in 8galls. of water, and the pest has disappeared, apparently owing to the spraying. This remedy, used at the above-mentioned strength, would be rather expensive for the average orchardist, but it might be worth while to apply it on trees which are specially attacked, more particularly when the fruit has been removed."

The Fruit Industry of California.

In a paper read by Professor E. J. Wickson before the Convention of Californian Fruitgrowers the following figures are quoted to show the magnitude of the fruit exports of that State for 1909:—

	Weight in lbs.	Value in Dollars.
Fresh deciduous fruits	230,000,000	4,600,000
Dried deciduous fruits	237,000,000	14,200,000
Citrus	908,000,000	18,000,000
Raisins	125,000,000	5,000,000
Nuts	14,000,000	1,400,000
Canned fruits.....	180,000,000	9,000,000
Olive products.....	—	500,000
Wine	240,000,000	6,000,000
Brandy	12,000,000	1,500,000
 Total	 1,946,000,000	 60,200,000

Sixty million dollars represents considerably over £12,000,000. The value of our wheat exports for the current year—with the best harvest on record—is estimated at a little over £4,000,000, so that the export of Californian fruit and vine products is three times as valuable as our wheat exports.

Harvesting Almonds.

At the Annual Convention of Californian Fruitgrowers, held last December, one of the leading almond-growers, Mr. J. P. Dargitz, read an interesting paper on almonds. Dealing with the harvesting, he said—"When the hulls on the nuts are loose from the shells, as will be indicated by their bursting open, it is time to begin gathering if you wish to hull them. If you wish to shell them, however, the drier they are the better. It will not pay to begin until the nuts about the crotches of the tree are ready, as they are the latest to ripen, and it does not pay to go over the trees twice. Have some sheets of heavy unbleached sheeting or light duck or sail cloth. Mine for large trees are 15ft. x 30ft.; two men to a sheet and two sheets to a tree. Spread the sheets under the tree, then with willow or bamboo poles jar the limbs which will cause the nuts to fall on the sheets. Always strike the limb sideways, for if you strike a glancing blow down the limb you bring your chances of next year's crop with you. The object is to get the nuts and disturb the foliage as little at possible. When the nuts are all off the tree the men toss their poles to the next tree and then gather up the sheets, one man at each end, and carry them to the next tree."

Varieties of Almonds.

Mr. J. P. Dargitz in the paper referred to above, says, in reference to varieties—"My first and great reliance is on Texas Prolific. It blooms later by two weeks than any other variety I know of; the tree grows well and bears every year. Trees now 20 years old have had 17 consecutive crops. I would also plant Nonpareil and Drake's Seedling alternating with Texas Prolific every two rows. The Nonpareil ripens early and can be gathered before the other varieties are ready. Then comes Drake's Seedling about three weeks later, and Texas Prolific is about two weeks later than Drake's. In Yolo County the Peerless is a great favorite, and the I X L is said to be a good bearer in some localities." So far as we know, Texas Prolific is not grown in South Australia, but in view of the late blossoming and consistent bearing it should be worth introducing.

Testing Arsenate of Lead Sprays.

The Horticultural Section of the Department of Agriculture is making a test of the comparative values of several of the arsenates of lead now on the market. The experiment is being conducted on a small orchard at Lyndoch. On February 22nd the third and last spraying was given to the Dunn's

Seedling and Rome Beauty apples in the orchard. Although it is premature to speak of the results of the tests, there is a vast difference in the condition of the fruit on the trees which have been sprayed and those in adjoining gardens which have not been treated.

New South Wales Fruit Regulations.

The Horticultural Instructor (Mr. G. Quinn) writes—"In January last the New South Wales Department of Agriculture intimated that in future fruit packed only in *new* cases would be permitted in the Broken Hill trade. We have since been informed, however, by the Under Secretary for Agriculture of New South Wales that it is the intention of the Government to adhere to the resolution of the conference of Ministers of Agriculture in regard to the Broken Hill fruit trade. This resolution was to the effect that owing to the peculiarly isolated position of Broken Hill secondhand cases would be admitted on condition that they were dipped or steamed in the presence of an inspector, and officially stamped with the date when such disinfection took place. This will, no doubt, be of considerable interest to fruitgrowers and dealers who are located at a distance from the metropolis, and who experience difficulty in keeping a supply of new cases."

Imports and Exports of Fruits and Plants.

During the month of January 8,576bush. of fresh fruits, 2,164 bags of potatoes, and 14 bags of onions were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act. Four hundred and seventy-six bushels of bananas were destroyed. The exports to inter-State markets comprised 8,459bush. of fresh fruits, 4,036 packages of vegetables, and 2 packages of plants, also examined at Adelaide. In addition 315bush. of fresh fruits were inspected and passed at Stirling North, 196bush. of fresh fruits at Wirrabara, and 436bush. at Clare. Under the Commerce Act 2,016bush. of fresh fruits, 285 packages of preserved fruits, and 1 package of plants were exported to oversea markets during the same period. These were distributed as follows:—For London, 47 cases apples, 303 cases pears, and 8 cases stone fruits, also 1 package of plants; for New Zealand, 12 cases grapes and 140 cases cherries, also 135 packages of preserved fruits; for India and East, 1,443 cases apples, 30 cases pears, 13 cases stone fruits, 20 cases cherries, and 150 packages preserved fruits. Under the Quarantine Act 993 packages of plants, seeds, bulbs, &c., were inspected and admitted from oversea. During

February 7,617bush. of fresh fruits, and 6,864 bags of potatoes, 27 bags of onions, and 4 packages plants were inspected and admitted at Adelaide. Four hundred and ninety-four bushels of bananas were destroyed. The exports to inter-State markets comprised 8,575bush. of fresh fruits, 3,445 packages of vegetables, also examined at Adelaide. In addition 114bush. of fresh fruits at Stirling North, 526bush. at Clare, 27bush. at Uraildla, 65bush. at Salisbury, and 21bush. at Laura were inspected and passed by the inspectors at those places. Under the Commerce Act 4,101bush. of fresh fruits, 262 packages preserved fruits, and 60 packages of honey were exported to oversea markets during the same period. These were distributed as follows:—For India and East, 1,844 cases apples, 20 cases pears, and 25 cases stone fruits, also 112 packages preserved fruit; for New Zealand, 442 cases grapes, and 150 packages preserved fruit; for London, 2,030 cases apples, 240 cases pears, 60 packages honey, and 1 package of seeds. Under the Quarantine Act 2,374 packages of plants, seeds, bulbs, &c. were inspected and admitted from oversea ports.

A Large New Walnut.

The *Pacific Rural Press* describes a large walnut known as Wilson's Wonder. The original tree is now eight years old, and it has borne heavily since its second year. The tree is a strong grower, with broad, dark-green foliage, while the fruit is borne in clusters of three, four, and sometimes up to ten. This clustering accounts for the peculiar shape, the stem end being narrower while in ordinary walnuts the reverse is the case. It blooms later than most varieties, and thus escapes injury by frost. The kernel is large and sweet, while the nuts are very large, specimens up to 5 $\frac{1}{2}$ in. x 6 $\frac{3}{4}$ in. in circumference being not uncommon. The shell is comparatively smooth and thin.

The Food of Plants.

In general it may be said that an abundant supply of phosphoric acid and potash, especially the former, tends to increase fruitfulness, hardiness and firmness of leaves and stems, while an abundance of nitrogen has a tendency to produce just the reverse conditions; and while the plant cannot be at its best without a suitable supply of nitrogen, the plants which are grown chiefly for their fruits may be easily injured by an amount only slightly exceeding a sufficiency.—PROF. I. P. ROBERTS.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungous pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

NUTRITIVE VALUE OF CEREALS AND GRASS GROWN ON RICH AND POOR LANDS.

"A.A.S." Mount Gambier, asks—"Are the cereals, oats, wheat, &c., grown on poor land of equal value for fattening and feeding purposes as the same variety of cereal grown on rich land?"

The Acting Principal of the Agricultural College (Mr. W. J. Colebatch, B.Sc.) replies—"It is generally accepted by agricultural chemists that grasses grown in dry seasons on good land make the best feed, though the quantity is generally reduced. Again, grasses grown in sunny weather are better than those in cloudy weather, or, to put it in another way, spring feed is generally better than autumn feed; wet or marshy land produces less nutritious growth than dry land; and, finally, grasses grown on rich loam or clay give a better analysis than those on poor thin soil. Storer, an American authority, gives the following analyses of samples of Timothy grass grown on a relatively poor soil, and on one that had been liberally manured, and you will note the marked increase in nitrogenous material in the latter case:—

	Rich Land. Per Cent.	Poor Land. Per Cent.
Ash	5·63	3·86
Nitrogenous matters	8·18	5·41
Carbohydrates	55·39	62·50
Crude fibre	27·08	23·93
Fat	3·72	2·70
	<hr/> 100·00	<hr/> 100·00

Wolff also gives the following table, showing the analyses of samples of a mixture of Timothy grass and Red clover grown on a heavy clay soil with light and heavy manures:—

	Light Manuring. Per Cent.	Heavy Manuring. Per Cent.
Ash	6·0	7·0
Nitrogenous matters	11·0	20·3
Carbohydrates	56·3	41·3
Crude fibre	22·5	26·6
Fat	4·2	4·8
	<hr/> 100·0	<hr/> 100·00

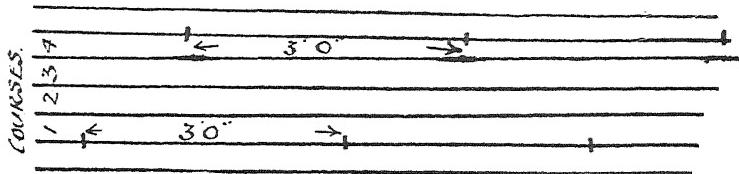
It will be noticed that in both the above illustrations the familiar truth that the composition of plants depends to no inconsiderable extent on the soil in which they grow is clearly shown. Considerable differences in the amount of nitrogenous material and carbohydrates are seen, and it should be noted that with the increase of nitrogen the percentage of crude fibre is also increased, and this possibly may result in a diminution in the amount of digestible nitrogenous matter. Further, it is generally held that fodder grown under unfavorable conditions contains less amide nitrogen, but if the present conception of the nutritive value of this form of nitrogen be true there is no advantage in this. In reading the above analyses it is important to note that both specimens of fodder were gathered at one and the same stage of maturity. It is essential to point this out inasmuch as the amounts of water, ash, fat, and albuminoid decrease while the amounts of carbohydrates and crude fibre increase as the grass grows older. The above practically sets out all that is known at the present time in regard to the question you raise. Bulk for bulk the fodder grown on good land is superior to that on poor land, and acre for acre gives even a greater difference in favor of the former. On rich land—that is, land which will grow maximum crops of grass or cereal—no material difference in composition can be expected to follow the application of different quantities and qualities of fertilisers; but on land capable of producing inferior crops the effect of fertilisers is undoubtedly to improve the quality of the produce. There can be no question that the application of phosphatic manures has assisted in some measure in the improvement of rickety pastures by increasing the phosphatic constituents in the herbage. Your reference to the practical value of oaten chaff from poor land as against that from rich land can probably be met by the view that in both cases the crop has been approximately a maximum one, and in that case, as mentioned above, no appreciable difference will be observed."

HOW TO BUILD A FRUIT HOUSE.

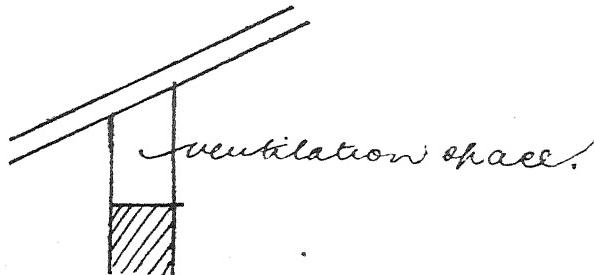
"Horticulture," Coromandel Valley, writes—"I am building a house for the storage of fruit, and should be glad to have some advice as to the best way to build same to secure the maximum of coolness together with efficient ventilation, which is essential. I propose building on the side of a hill, cutting back into the hill to a depth of about 6ft. at the top end, and using the spoil to level up at the lower end so as to have the lower wall to that depth covered with earth. The walls to be built of a double wall of single brick (4½in.) with 4in. to 5in. space between; at the lower end inlet holes to admit a current of air will be left, while I have in view at each corner an outlet a little above the height of the roof to secure the passage of a current of air. The store will be in two stories, the top being used for packing the fruit and the bottom for storing. There will require to be a chimney or shaft to ventilate the lower room—possibly one each end is necessary, the store being about 24ft. x 14ft. wide. The points I should particularly like information upon are—(1) Is the wall of type suggested strong enough? (2) What size joists should be used to carry the floor of the upper room, the joists to be supported by wooden posts from the floor? (3) The best way to ventilate the rooms? (4) Any better method of reducing temperature of store? Economy and simplicity of erection are of importance; it is proposed to put on a double roof, the first of thatch or other material, with galvanized iron 4in. to 6in. above this."

The Superintendent of Public Buildings (Mr. C. E. Owen Smyth), to whom the matter was referred, replies—" (1) Yes, but would suggest the walls be built as follows, with 8in. between walls, and tied together with galvanized

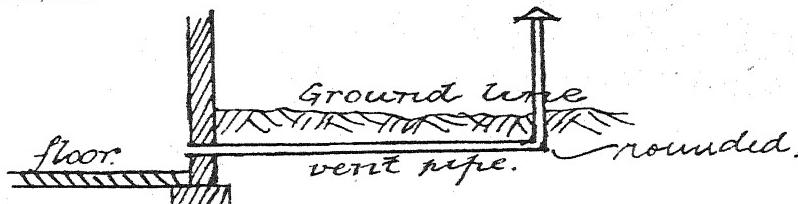
wire ties every fourth course and 3ft. apart in row, and alternating with those in row under, thus—



(2) 6in. x 2in., supported half way from the floor below. The joists should be about 18in. apart. (3) Overhang the eaves, and leave good ventilation spaces at intervals at top of wall thus:—



If possible a very good ventilation is by means of a vent pipe taken from the bottom of building and laid under the ground for some distance from the building, and then erected in the form of a shaft with the outlet higher than the inlet, thus—



Section

(4)*No better method of keeping the place cool than that suggested in your letter of building a double roof."

PARALYSIS IN CATTLE.

The Utera Plains Branch of the Agricultural Bureau writes—"Members wish to know what is the best remedy for cattle which are dying of what is known as "dry bible." The cattle are going stiff and foaming at the mouth, and very soon get poor; they get down and cannot rise."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"In dealing with outbreaks of paralysis in cattle (wrongly termed "dry bible"), preventive treatment should be systematically carried out as soon as possible. When the animals are totally paralysed, and unable to swallow, curative treatment is practically useless. If the animal is in good

condition it should be slaughtered, and if otherwise healthy the carcass could be utilised for human consumption. Particular attention should be paid to the remaining cattle, especially the milking cows. These should receive a drench consisting of 1lb. Epsom salts and 1lb. treacle dissolved in a quart of lukewarm water. Follow this by giving daily 3ozs. sweet bonemeal and 3ozs. salt in the feed, or put a lick consisting of equal parts of sweet bonemeal and salt at convenient places for the cattle to lick. Chaff and bran, and other nutritious food, such as boiled wheat, oats, or other grain, should be regularly administered. The preventive treatment has been successful when properly carried out."

CLOVER FOR STOCK.

"A. W." writes—"I am requested by a resident of Currency Creek to forward to you for identification a specimen of clover. It has lately been noticed growing about Goolwa and Currency Creek, and the question raised, "Is it good for stock?"

Mr. W. L. Summers (Acting Secretary to the Minister of Agriculture) replies—"Without the seed heads it is not possible to say definitely what clover this is, but we have very little doubt that it is Strawberry clover (*Trifolium fragiferum*). This clover is very valuable for moist flats, and will grow on land too wet for most clovers. It is much liked by stock and is very good feed."

TREATMENT FOR DAMAGED EYE OF HORSE.

"J.P." Green's Plains West, writes asking how he should treat a horse with a damaged eye. He states—"This horse had a piece of chaff $\frac{1}{2}$ in. long in the eye, which, I believe, was there for two or three days before I noticed and removed it. The eye is now left with a thick white scum, and is inflamed. The animal is almost blind. I have been blowing in bluestone (one-third) and salt (two-thirds), and bathing with Condy's crystals made in a hot fluid. It is recovering very slowly if at all."

Mr. J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon) replies—"I regret that you did not ask the Stock Department for advice as soon as the trouble was observed. It is not a good treatment to blow bluestone and salt into the eye. Serious results are liable to follow such treatment. The following lotion can be tried:—Sulphate of zinc, 12 grains; tincture of opium, $1\frac{1}{2}$ drachms; add 4 ounces water, and mix. Apply the compound with a clean feather or dropper twice daily."

CODLIN MOTH IN PEACHES.

"S.D." King William Street, has forwarded a couple of peaches containing what he calls "maggots," and asks what they really are.

The Horticultural Instructor (Mr. G. Quinn) replies—"On examination it was found that the peaches were burrowed by the caterpillars of the codlin moth. Although it is comparatively rare for this pest to attack peaches, yet it has been reported on a number of previous occasions. Up to the present we have not succeeded in developing a true codlin moth from caterpillars which have fed on peaches, but we have done so from those caterpillars which have attacked half-ripe apricots. As a rule this insect does not infest stone fruits, unless they are growing close to pip fruits in which the insect is very prevalent; and in this case I suspect that there is a pear or an apple tree badly affected by codlin moth in the immediate vicinity. Such diseased fruits should be picked off and destroyed."

CODLIN MOTH INFESTED ORCHARDS.

"E.D.," Baker's Gully, has written to the Department protesting against any of his fruit trees being destroyed because he has not attended to them for the purpose of checking the codlin moth pest during the last seven or eight years. He asks that he may be let alone in the matter.

The Horticultural Instructor (Mr. G. Quinn) replies—"The law of the State requires everyone who has been served with a notice to take certain precautions to destroy the codlin moth, and in the event of his failing to do so he is liable to prosecution. He is offered the option, however, of cutting out his trees. This is only fair, as there are hundreds of instances of men who have half a dozen trees, such as this correspondent, who pay little or no attention to them, and, because it is not a means of livelihood, do not consider they should be compelled to check the codlin moth pest for the benefit of their neighbors who may grow apples for commercial purposes."

GALLS ON PEAR TREES.

"G.G.," Petersburg, has forwarded to the Department of Agriculture a leaf from a pear tree covered with reddish-brown galls, and asks what would be a remedy for the disease.

The Horticultural Instructor (Mr. G. Quinn) replies—"The pear leaf submitted is affected by the pear leaf gall mite (*Phytoptus pyri*). This insect makes channels or galls between the surfaces of the leaf, and hence the spots are visible. The insect itself is microscopic in size, and passes the winter beneath the scales of the buds. If the trees are sprayed with kerosine emulsion just as the scales of the winter buds begin to unfold in early spring, before the flowers open, the pest will be almost completely destroyed, for a time at any rate.

SWEET POTATOES.

The Longwood Branch of the Agricultural Bureau has written asking how to grow sweet potatoes.

The Horticultural Instructor (Mr. G. Quinn) replies—"The only individual near Adelaide I know who has regularly cultivated sweet potatoes is Mr. T. B. Robson, of Ellythorpe, Hectorville. The method he has found successful is as follows:—In the autumn, before the ground has become too cold or wet, small tubers from the best plants are selected and put away in dry sand. The small tubers keep better than the larger type, and placing them in dry sand appears to be the best way of preserving them. In the springtime, about September or October, an ordinary hotbed is made from fresh stable manure. On this a shallower layer of loose soil is placed, and the tubers are placed 2in. or 3in. deep in this soil. They immediately begin to send up shoots, and when these are 5in. or 6in. long and have given out a number of roots they are taken off and planted about 18in. from each other, in rows about 4ft. apart. Several crops of these shoots may be obtained from the one lot of tubers. Mr. Robson has tried the following varieties:—Pearson, a large yellow roundish tuber of good quality; White Maltese, a long narrow, white tuber; a pink variety, which has a large pink root, but not quite as good as Pearson; Yellow Short Top, a yellow short tuber, of medium quality only, and which tends to crack. No doubt Mr. Robson, for a small consideration, will supply anyone with a few young plants in the springtime with which to make a start."

AGRICULTURAL EXPERIMENTAL WORK, 1909-10.

Dry Farming Experiments.

By W. ANGUS, B.Sc. (Director of Agriculture).

In most countries at the present time a good deal of attention is being given to the development of agriculture, and in this work the carrying out of schemes or experiments in different localities is playing a most important part. Great Britain and America have for years recognised the value and power of work of this nature. In the latter country we find a large number of splendidly equipped experimental stations and substations scattered throughout the agricultural areas, working either in conjunction with one of the numerous agricultural colleges or with the Central Department of Agriculture. But the system of placing experiments in the hands of the farmer, to be carried out by him under the supervision and direction of some central authority, has of late been more largely developed in Great Britain, where almost every county has its Agricultural Education Committee and its staff of trained experts. In South Australia endeavor is being made to combine these two, and the ideal condition will be realised when each district has its properly equipped experimental farm, and grouped round each farm schemes of experiments under careful supervision and control. The very existence of these experimental farms will ensure the proper supervision of its extension work. Up to the present good work has been done by these local centres, and the popularity of the work is evident from the fact that during the year a number of requests have been received for the establishment of centres of this kind in other districts, and there is yet ample room for the expansion of this work. With the South Australian farmer an ounce of practice is worth a pound of theory, and in carrying out these experiments from year to year under his care a most powerful means of improving our agricultural methods and practices is being employed.

From the important place which wheat holds in the production of the State, naturally the greater part of the experimental work has been connected with the production of that cereal. The results of the various experiments throughout the State are now to hand, and we shall deal with them under various headings.

DRY FARMING EXPERIMENTS.

Two years ago work was commenced on the farm of Mr. Thomas Griffin, of Hammond, with a view of testing the system of growing crops in our semi-arid regions, which has been so prominently associated with the name of Campbell in America. Undoubtedly this work is being enthusiastically entered upon in the States, as will be seen from the able report by Senator McColl on the proceedings of the Dry Farming Conference recently held in America. One cannot, however, read the addresses given and the reports submitted at such conferences without realising that this system of farming is neither new nor is it capable of being applied under hard and fast rules in every country. Hence the necessity for working out a scheme suitable to the conditions prevailing in South Australia.

The main objects of dry farming are—1. The conservation of soil moisture in regions where there is a scanty rainfall; and 2, The greater development of the root system of the plant. These are the two essentials of dry farming—to have the moisture available in the soil, and to have the soil in such a condition as to allow the development of a large root system. These are brought about in the main by means of surface discing of the soil to catch the earliest rains,

deep ploughing, the use of the subsurface packer, and thorough surface cultivation afterwards. The processes of discing and subpacking are new to us in South Australia, but Campbell says that these are essential, especially the subpacking after the ploughing; and he claims for this process that it has the effect of producing a layer of soil just under the top few inches fine, firm, and moist, and most suited as a seed bed.

With the object of testing these processes under the conditions existing in that large tract of semi-arid country around Hammond, work as above mentioned was put in hand on the farm of Mr. T. Griffin.

The following record of the rainfall for the last ten years, together with the average for that period, indicates the arid nature of the country:—1900, 9.47in.; 1901, 7.93in.; 1902, 6.51in.; 1903, 16.29in.; 1904, 9.73in.; 1905, 8.77in.; 1906, 13.85in.; 1907, 11.40in.; 1908, 18.58in.; 1909, 14.58in.; total, 116.56in.; average 11.65in. for the last 10 years; or 11.23in. for the last 23 years.

The following table shows the rainfall each month from June, 1908, to November 1909:—

	1908. Inches.	1909. Inches.
January	—	—
February	—	—
March	—	—
April	—	.33
May	—	1.54
June .....	.84	3.35
July .....	.17	1.08
August	3.38	1.78
September	1.16	.53
October	3.00	.36
November .....	.37	.52
December .....	.92	—
 Total	 9.84	 9.69

The soil on most of this farm is a chocolate loam, with a limestone marl and rubble underneath, and it was formerly bluebush country.

The following table gives a detailed account of the plots, showing the method of treatment and the results for 1909 and 1910, together with the average for those two years:—

No. of Plot.	Method of Treatment.	Yields per Acre		Average Yield for Two Years.
		1908-9.	1909-10.	
1	Disced, ploughed 6in. deep, immediately subpacked and thoroughly surface-cultivated during the summer	Bus. Lbs. 23 41	Bus. Lbs. 19 22	Bus. Lbs. 21 31
2	Disced, ploughed 6in. deep, thoroughly surface-cultivated during summer, but <i>not</i> subpacked	20 27	14 49	17 38
3	Disced, ploughed 6in. deep, thoroughly surface-cultivated during summer, and subpacked before sowing	20 54	12 22	16 38
4	Disced, ploughed 4in. deep, otherwise same as plot 1	17 42	14 15	15 68
5	Disced, ploughed 4in. deep, otherwise same as plot 2	14 21	8 57	11 39
6	Disced, ploughed 4in. deep, otherwise same as plot 3	12 22	12 26	12 24
7	Ploughed 4in. in autumn and subpacked.....	14 4	15 12	14 38
8	Ploughed 4in. in autumn, but <i>not</i> subpacked	12 44	16 31	14 37

(The area of each plot was 5 acres in 1908-9, and 3 acres in 1909-10.)

In both years the variety of wheat sown was Federation, and 60lbs. of superphosphate per acre was applied with the seed. In 1908 the sowing was a month earlier than last year, but the harvesting was done at the end of November in each season.

A study of the scheme of the experiments will show the following comparable points:—1. Deep ploughing as against shallower ploughing as part of the fallowing of the land. 2. Fallowing against autumn ploughing, both for 6in. and 4in. deep. 3. Subpacking as against no subpacking.

Looking at the results of these different methods of handling the land we notice that in both years the deep ploughing has in each of the three plots given a substantial increase over the shallower ploughing. The following analysis of the table will bear this out:—

	1908-9.	1909-10.
Plot 1 over plot 4	6bush.	5bush.
Plot 2 over plot 5	6 "	6 "
Plot 3 over plot 6	$8\frac{1}{2}$ "	—

The first two of these give convincing proof of the advantage of deep ploughing during the process of fallowing; but this is not borne out in the third, where this year there is no advantage shown in favor of deep ploughing as against the $8\frac{1}{2}$ bush. in its favor last year.

Secondly, let us compare the results from the thoroughly fallowed land and autumn ploughed land. Here the ploughing in the autumn was 4in. deep, and hence plots 7 and 8 are comparable with plots 4 and 5 respectively. The results for the two years' work do not bear out any advantage in favor of shallow ploughing and fallowing as against autumn ploughing. This is especially the case so far as this season's results are concerned, indeed, plot 5 gives only about half the yield of plot 8.

Therefore let us see how the plots that have been subsurface packed compare with those that have not:—

	1908-9.	1909-10.
Plot 1 over plot 2	$3\frac{1}{2}$ bush.	$4\frac{3}{4}$ bush.
Plot 4 over plot 5	$3\frac{1}{2}$ "	$5\frac{1}{2}$ "

This table points plainly to the fact that for the last two years at least the process of subpacking has in each case given a substantial increase. Taking the average yields we find that in the case of the 6in. ploughing the subpacking shows an increase of about 4bush to the acre, and in the plots ploughed 4in. deep, an increase of just over 4bush. These increases, with wheat at 4s. a bushel, show a very substantial margin in each case over the cost of subpacking. It will also be seen that the use of the subpacker just previous to sowing has had no beneficial effect, either with fallowed land or with land ploughed in the autumn.

Summarising these results, we would say that the results so far bear out the following:—1. That deep ploughing, where the land is fallowed, is advantageous. 2. That the use of the subsurface packer immediately after the plough, in the process of fallowing, both in deep and shallow ploughing, has given most satisfactory increases. 3. That the use of the subsurface packer immediately before sowing has given no appreciable increases, either on fallowed land or land ploughed in the autumn.

The experiments at Hammond so far have given most satisfactory results, and it is only fair to Mr. Griffin to put on record the fact that they have been carried out by him with the very greatest care. The condition and arrangements of these plots this year, as well as those connected with the wheat varieties test, reflect the very greatest credit on Mr. Griffin. The result already

to hand will certainly call forth greater interest in these special experiments; but it must be borne in mind that they must be carried out for a number of years yet before the results can justify us in coming to a decisive judgment regarding the system of dry farming.

In addition to the experiments at Hammond two other centres were opened last year on the farms of Mr. L. Chalmers, of Oladdie, and Mr. C. H. Meyers, of Dawson.

Unfortunately in the case of the Oladdie plots the results were much interfered with by the ravages of grasshoppers, while some of the plots were damaged by the farm stock. The Dawson plots, too, were to some extent damaged by grasshoppers, and the land selected was not very suitable for the work. The crops here were blighted very much, and Mr. Meyers thought that 60lbs. of super. per acre was too heavy a dressing. In each case there were such disturbing factors introduced in the tests as to make the results of little account whatever; hence the reason for their non-publication.



A HARVEST FIELD.

B

ANALYSES OF FERTILISERS.

By W. L. SUMMERS, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers taken during the past few months, are published for general information. In each case the certificate of constituents or guarantee registered by the vendor is shown in parentheses, thus (36 per cent.), immediately before the results of the analyses:—

Adelaide Chemical and Fertilizer Company, Limited—Mineral super., water-soluble phosphate (36 per cent.), 39·1 per cent., 37·8 per cent.

Adelaide Chemical and Fertilizer Company, Limited—S.A. super., water-soluble phosphate (30 per cent.), 33·4 per cent., 33·8 per cent., 32·3 per cent.

Adelaide Chemical and Fertilizer Company, Limited—Super. B., water-soluble phosphate (16 per cent.), 14·7 per cent., 17·2 per cent.; citrate-soluble phosphate (14 per cent.), 22·3 per cent., 23·6 per cent.; acid-soluble phosphate (8 per cent.), not tested.

Adelaide Chemical and Fertilizer Company, Limited—Guano super., water-soluble phosphate (25 per cent.), 32·4 per cent., 27·3 per cent., 28·6 per cent.; citrate-soluble phosphate (5 per cent.), 4·2 per cent., 6·5 per cent., 4·6 per cent.; acid-soluble phosphate (8 per cent.), not tested.

Adelaide Chemical and Fertilizer Company, Limited—Wheat manure, water-soluble phosphate (28 per cent.), 31·4 per cent.; citrate-soluble phosphate (5 per cent.), 11·8 per cent.; acid-soluble phosphate (7 per cent.), 4·2 per cent.; nitrogen (1·05 per cent.), 1·01 per cent.

Adelaide Chemical and Fertilizer Company, Limited—Bonedust, nitrogen, (3·25 per cent.), 3·74 per cent.; acid-soluble phosphate (45 per cent.), 48 per cent.

E. Anders & Sons—Bonedust, nitrogen (3 per cent.), 4·30 per cent.; acid-soluble phosphate (40 per cent.), 46·3 per cent.

Bagot, Shakes, & Lewis, Limited—Japan super., water-soluble phosphate (38 per cent.), 40·3 per cent., 40·4 per cent.

Crompton & Son—Bonedust, nitrogen (3·8 per cent.), 4·10 per cent.; acid-soluble phosphate (44·67 per cent.), 46·3 per cent.; fertiliser, nitrogen (3·3 per cent.), 3·23 per cent.; potash (3·8 per cent.), 0·14 per cent.; acid-soluble phosphate (1·20 per cent.), not tested.

Elder, Smith, & Company, Limited—Lawes' super., water-soluble phosphate (36 per cent.), 39·3 per cent., 38·4 per cent.; superphosphate, water-soluble phosphate (36 per cent.), 39·4 per cent.

A. H. Hasell—Superphosphate, water-soluble phosphate (38 per cent.), 40·8 per cent.

Mount Lyell Mining and Railway Company, Limited—Standard super., water-soluble phosphate (36 per cent.), 37·2 per cent., 38·9 per cent.; citrate-soluble phosphate (2·18 per cent.), not tested; acid-soluble phosphate (4·36 per cent.), not tested.; Adelaide super., water-soluble phosphate (30 per cent.), 33·1 per cent.; citrate-soluble phosphate (2·18 per cent.), not tested; acid-soluble phosphate (4·36 per cent.), not tested.

Norman & Co.—Super., water-soluble phosphate (36 per cent.), 39·2 per cent., 37·8 per cent.; acid-soluble phosphate (3 per cent.), not tested; Thomas phosphate, acid-soluble phosphate (30 per cent.), 31·6 per cent.

Wallaroo Phosphate Company—Super., water-soluble phosphate (36 per cent.), 35·9 per cent., 41·3 per cent.; Y.P. super., water-soluble phosphate (30 per cent.), 33·4 per cent.

THE ADELAIDE MARCH SHOW.

Government Wheat Exhibit.

Recognising the value of an educational exhibit the Department of Agriculture followed the usual practice this year at the Royal Agricultural Society's Show of staging exhibits from the various Experimental Farms under its control.

At the Adelaide Autumn Show the South Australian farmer looks to the Parafield Wheat Research Station to produce new or improved wheats, suited to the climatic conditions of the State and satisfactory alike to the farmer and to the miller. With the idea of giving producers a chance of seeing on what lines the work at this station is being carried on a wheat trophy was arranged on which were shown a large number of different varieties of wheat. These included Indian, Hungarian, Manitoban, and Russian wheats shown alongside some of the standard varieties grown in this State, such as Federation, Yandilla King, Comeback, Gluyas, &c., while a sheaf of Medeah—a bearded hay wheat over 7ft. high—occupied the centre of the stand. Most of these varieties were shown both in the sheaf and grain, a fact which is much appreciated by the average farmer.

The chief feature, however, of the wheat section of the exhibit was a number of crossbred heads shown in glass tubes. These were so arranged as to show the heads of the parent plants together with those of the resulting cross, thus enabling a comparison to be made. To the farmer who is denied the opportunity—either from want of time or great distance—of visiting the Parafield Farm, these crossbred heads proved of exceptional interest, and the details of crossing and the nature of the consequent selection work were explained by the officers in attendance.

The Murray Bridge Experimental Farm was represented by a fine display of lucerne and fodder plants arranged under the supervision of Mr. S. McIntosh, the manager of the Farm. The growing of lucerne—so long neglected—is now occupying the attention of a large number of producers, and Mr. McIntosh was kept busy answering many inquiries concerning the merits of the various varieties. Amongst those shown were Arabian, South Australian, Provence, Hunter River, Turkestan, Peruvian, and American. These were shown in various stages of growth, from 14 to 35 days. In the case of the Arabian lucerne a seven days' growth was also shown which was equal to 14 days' growth of any of the other varieties, thus showing its superiority as a rapid grower. A large number of grasses were also shown, including *Panicum crusgalli*, *Paspalum dilatatum*, *Phalaris commutata*, &c.

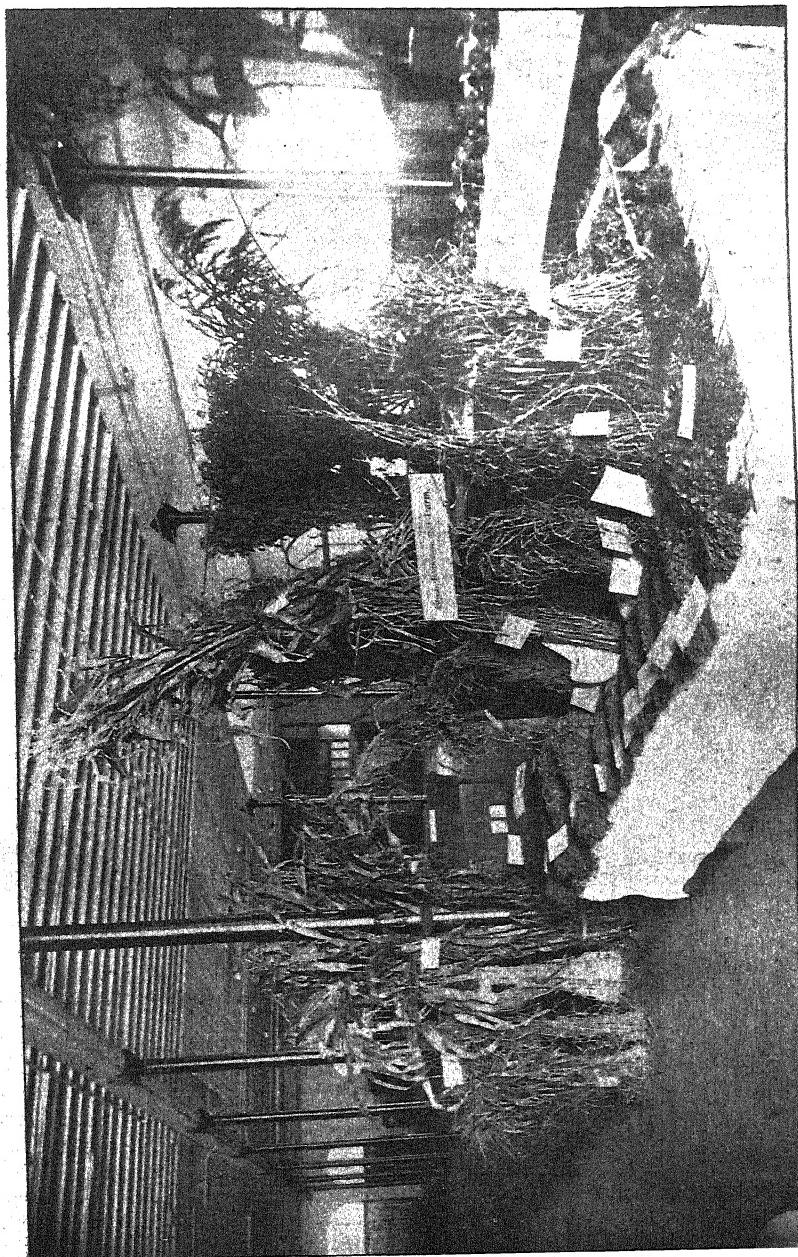
The Kingscote Branch of the Agricultural Bureau forwarded some fine specimens of malting barley, oats and wheat, together with several varieties of apples, pears, onions, potatoes, peaches, large squashes, &c., all testifying to

the fact that the products from some parts of Kangaroo Island at least are able to compete with the best that can be grown on the mainland. These exhibits were incorporated with the general display of the Department, which also included a collection of apples from the type orchard at Mylor. Unfortunately the exhibit of the Department was not allotted as conspicuous a position as its importance deserved.



W. S. Smith, Photo.

THE PARAFIELD EXHIBIT.



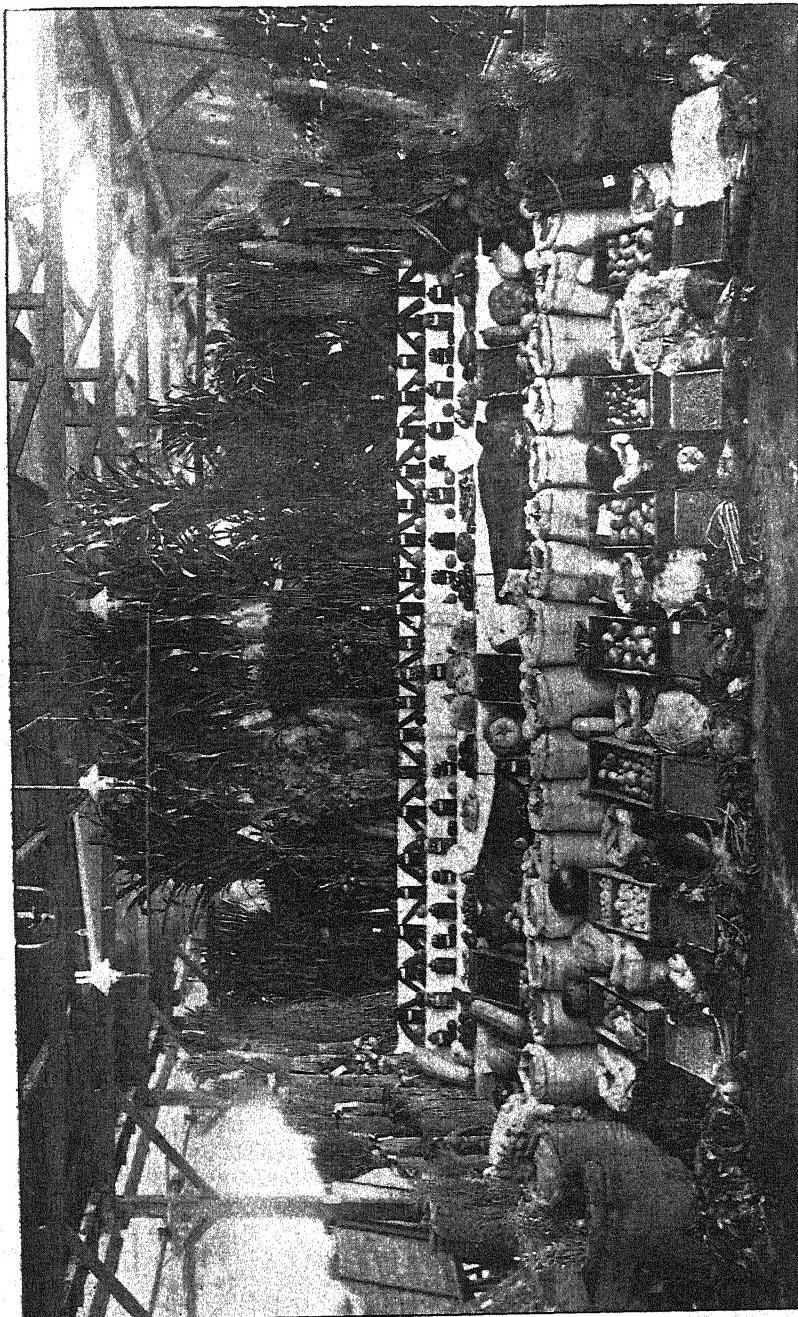
S. Smith, Photo.] THE EXHIBIT OF THE MURRAY BRIDGE EXPERIMENTAL FARM.

COLLECTION OF FARM PRODUCE.

One of the most noteworthy exhibits at the Autumn Show of the Royal Agricultural and Horticultural Society was that of Messrs. C. B. and J. Pope, of Mount Barker, who entered a collection of farm produce for the valuable prizes offered by Elder, Smith, & Co. These prizes, which amount to £50, are offered for farm produce from two divisions of the State, and there was one entry in each division—Mr. H. Billinghurst in the northern division and Messrs. Pope Bros. in the southern division. Messrs. Pope Bros.' exhibit attracted attention not only on account of the great varieties of articles which it embraced, but because of the excellent quality of the exhibits and the attractive manner in which they were staged. The proof of quality is supplied by the fact that in addition to taking Messrs. Elder, Smith, & Co.'s prize Messrs. Pope Bros. carried off 18 first and seven second prizes in the agricultural produce section of the show, the total amount of their prize money being roughly £60. Their successes in competition were as follows:—First prizes for collection of grain, bag of wheat with samples of straw in hay and wheat stages, best hay wheat, white oats, Algerian oats, Dun or grey oats, rye, maize, field peas (Dun), do. (Partridge), horse beans, cultivated grasses, hay, mangolds (long), do. (collection), new green fodder plant, collection of green horens, and collection of green fodder plants; and second prizes for collection of rust-resisting wheats, Cape barley, white oats, Cape oats, Dun or grey oats, chaff, and mangolds (oval). Their collection of farm produce, which attracted so much attention comprised the following:—

Dairy Produce.—Butter, milk, cream, eggs (geese, fowl, and duck), ham, bacon, lamb, lard, tallow, bread, scones, biscuits, and cakes (3 varieties). *Fresh Fruits*.—Apples (6 varieties), pears (7 varieties), plums, tomatoes (9 varieties), and peaches (2 varieties). *Dried Fruits*.—Apples, pears, and plums. *Preserved Fruits and Jams*.—Cherries (3 varieties), peaches, plums (2 varieties), pears (2 varieties), gooseberries, and jellies (5 varieties). *Fresh Vegetables*.—Cabbages, carrots (3 varieties), parsnips (2 varieties), beans (broad and French), peas, onions (3 varieties), beet (2 varieties), celery, rhubarb, cucumbers (3 varieties), pumpkins (8 varieties), marrows (8 varieties), gourds (6 varieties), piemelons, watermelons, and Turk's cap. *Sauces*.—Tomato, plum, tomato chutney, and apple chutney. *Pickles*.—Tomato, onion, bean, cauliflower, and cabbage (red). *Roots*.—Mangolds (6 varieties), swedes. *Potatoes*.—Half-hundredweight lots of Carmen No. 1, Crines' Lightning, Bismarck, Green Mountain, Irish Dairy, and collection of Royal Kidney, Beauty of Hebron, Vermont Gold Coin, Redskin, Queen of Veldt, Pinkeye, and Challenge. *Grain*.—Wheat in bushel bags—Bobs, Comeback, Leake's Rust-proof, Tarragon, Correll's No. 7, Green Tuscan, Baroota Wonder, Federation, Yandilla King, Galland's Hybrid, and Silver King. Maize—Ninety-day and Horsetooth. Barley—Cape and Chevalier. Oats—Scotch Grey, Cape, Potato, Algerian, Dun, and Garton. Rye—Spetz. Peas.—Dun, Partridge, Yorkshire Hero, and New Zealand Blue. Hay.—Wheaten and oaten. Chaff.—Oaten, wheaten, and lucerne. Grasses.—Ten varieties. *Green Fodder*.—Maize (4 varieties), sorghum, amber cane, Kaffir corn, Planter's Friend, Pencillaria, Hungarian Miller, lucerne, paspalum, rape, cow peas, and Chow Mollier. *Wattle*.—Bark, seed, and gum. *Wool*.—Lincoln, Shropshire, and Merino.

The value of the exhibit from a South Australian point of view lies in the fact that all produce included in it was obtained from a small farm of 173 acres, which Messrs. Pope Bros. have successfully cultivated in a thorough and scientific manner for the last 12 years. Their work is an object lesson to the State, and shows what may be achieved in the rich districts of South Australia which have either a good rainfall or an ample water supply.



MESSRS. POPE BROS.' PRIZE EXHIBIT OF FARM PRODUCE.

Krischeky, Photo.]

ROSEWORTHY AGRICULTURAL COLLEGE.

Harvest Report, 1909.

PART I.—ENSILAGE, HAY, BARLEY, OATS.

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

By way of explanation of anything that might possibly appear amiss, it should be stated that this report is drawn up under unusual difficulties. When January 20th was fixed upon as the date of my departure on leave for Europe, I fully anticipated that ere then I should have had ample time to report on the present season's harvesting operations. An exceptionally late season had not, however, been taken into my calculations, and an exceptionally late season it is proving, particularly in so far as unavoidable delays in connection with harvesting operations are concerned. In drawing up this report, therefore, I have not the advantage of a complete bird's eye view of completed results: I am compelled to deal with it in sections, according as the various data become available, and to leave to other hands its completion and the filling in of unavoidable gaps.

WEATHER CONDITIONS IN 1909.

In Table I. below is shown the distribution of the rainfall, month by month, in 1909, relatively to the mean distribution of the past 26 years.

TABLE I.—Showing Rainfall in 1909 comparatively with Means of preceding 26 years.

	Mean of 1909. Preceding 26 Years.		Mean of 1909. Preceding 26 Years.				
	Inches.	Inches.	Inches.	Inches.			
January	0·75	..	0·89	August	4·56	..	2·04
February	0·28	..	0·47	September	1·52	..	1·72
March	1·17	..	0·74	October	2·55	..	1·63
April	1·91	..	1·89	November	2·08	..	0·95
May	2·89	..	1·76	December	0·70	..	0·75
June	1·84	..	2·73				
July	3·80	..	1·81	Yearly total	23·05	..	17·38

This total rainfall of 23·05 inches is one of the highest on our records, having been exceeded only on two occasions, viz., in 1889 with 25·55 inches, and in 1890 with 27·60 inches. In addition, its general distribution has been essentially favorable to the growing of cereals, albeit interfering somewhat with harvesting operations.

In a general review of the year it may be said that late autumn and early winter weather was, on the whole, favorable to seeding operations, although drilling was rather frequently interrupted by heavy showers of rain. Germination and early growth of the cereal crops was exceedingly satisfactory throughout the

district, which proved very fortunate when later on, in common with the rest of the State, we had to run the gauntlet of one of the wettest winters on our records. The crops in many fields of the neighborhood were drowned by the continuous rains, followed by unending drainage from the upper levels. Fortunately, with the exception of a few claypans, our crops did not suffer to any extent from the heavy winter rains, and towards early spring were very promising in general appearance. Towards the end of September all our crops were very forward, showing everywhere very heavy; indeed, in many cases rank growth. Unfortunately for us these heavy crops had to stand the brunt of rough, squally weather both in October and November, with the result that many fields were badly lodged, and proved ultimately very difficult to harvest.

Up to about October 23rd weather conditions generally were such as to lead to very soft, sappy growth in the plants. On October 23rd and 24th hot weather, accompanied by north winds, set in somewhat suddenly, and had the effect of blighting off the crop of one of our finest looking fields, field No. 16. Parts of this field were damaged past recovery for a grain crop, and we found ourselves compelled to cut out the affected portions for hay. Several other fields in which the crops had reached a similar stage of growth suffered similarly, although not to an equal degree.

In summary, it may be stated that, notwithstanding a few accidental disadvantages, the season has proved a magnificent one for the cereals, whether harvested as grain or as hay, but particularly the latter. The general lateness of the season, however, has been far more advantageous to late, poor-grown crops than to our own, which were well-grown and forward from the very outset, and perhaps in cases a trifle over-rank.

ENSILAGE CROP.

Originally some 30 acres of the field known as No. 5A were sown for an ensilage crop. Seeding operations were, however, unavoidably delayed in this field, with the result that the crop was not sufficiently forward for the purpose in October. I decided, therefore, to leave it for hay, and to cut out as ensilage portion of a well-grown forward crop sown for hay in "Nottle's."

The past history of this field will be dealt with later on in connection with the hay crop; it will be sufficient to state here that the field had been treated as bare fallow in the preceding year and depastured the year before. The field was drilled with 236lbs. of 36/34 superphosphate to the acre between March 3rd and April 1st; the seed was broadcasted and scarified in between April 27th and May 1st. The following seed-mixture was used for the purpose:—Calcutta oats (Mount Gambier seed), 60lbs. per acre; King's Early wheat, 100lbs. per acre; lucerne, 4lbs. per acre; vetches, 8lbs. per acre. The lucerne seed was broadcasted afterwards and harrowed in.

Ensilage cutting operations started on October 6th and were completed by October 19th. For the purpose we cut out in this field 11·544 acres, yielding in all 112·46 tons, and representing 9 tons 14cwts. 94lbs. of green stuff to the acre.

In addition to this several minor lots were cut out for ensilage purposes. In "Grainger's" 3·999 acres of a similar mixture were cut out, yielding in all 43·18 tons, or 10 tons 15cwts. 10lbs. of green stuff to the acre. In the permanent experiment field we cut out part of plot 8 for ensilage (1·429 acres), which returned 14·30 tons of a green mixture of vetches and oats, representing a yield of 10 tons 16lbs. to the acre. Two lucerne plots were also cut out for ensilage: plot B, sown to lucerne in the autumn of 1908, 1·926 acres in area, returned 3½ tons, or 1 ton 16cwts. 39lbs. to the acre; and plot C, sown to

FIELD No. 16.

No. 16 is a very poor field of the old farm, heavily strewn over with trachite limestone rubble, and running into a native pine sandridge towards its eastern boundary. The recent history of No. 16 is briefly summarised below:—

1899.....	Barley	1906.....	Pasture (4·33 sheep to the acre for 12 months)
1900... .	Wheat and oats	1907.....	Pasture (2·73 sheep to the acre for 12 months)
1901.....	Bare fallow	1908.....	Bare fallow (partly), white mustard (partly)
1902.....	Wheat		
1903.....	Pasture		
1904.....	Pic melons		
1905.....	Barley and rye	1909.....	Wheat

The main crop in this field was represented by 51 acres of King's Red (second selection), sown at the rate of 85lbs. of seed to the acre with 195lbs. of 36/38 superphosphate between May 13th and 18th.

Throughout the season, right down to the 23rd of October, this field looked magnificent; indeed, it may be stated without invidiousness that the crop was much admired by all visitors to the institution. I have already had occasion to refer to the sudden spell of hot weather, accompanied by northerly winds, which set in on October 23rd and 24th. More than any other field on the College Farm No. 16 suffered from its ill effects. The bulk of the crop, which at the time carried well-developed grain, appeared to bleach and wither away under our eyes, and ultimately some 23·66 acres had to be cut for hay.

TAKEALL.

I am well aware that many would invoke that convenient term "takeall" in explanation of our misadventures in this field. It is a most unfortunate term, the creation of which I sincerely deplore—an all-embracing creator of confusion most readily adopted and yet conveying no explanation of what it may be supposed to describe. A wheat crop, for example, in the early stages of its growth dies out in ever-widening circles—it is, of course, affected with "takeall." At a later stage of its growth white heads show up amidst the yellowing corn—again it is a matter of "takeall." I do not wish to make light of the subject; indeed, with many I understand it to be a sore grievance. I am merely protesting against the indiscriminate use of the term, which conveniently covers all ills, without specifying any individual one. We must surely realise that the dying out of wheat in circular patches or the appearance of white heads in the ripening crop might owe its origin to a variety of causes; and that to include them all under the all-embracing term "takeall" can but have the effect of clouding whatever issues may be at stake.

Quite recently Mr. McAlpine, of the Victorian Department of Agriculture, has in certain well-defined cases connected "takeall" with the development of a parasitic fungus, the "Wheat-stem killer" (*Ophiobolus graminis*); Mr. McAlpine, however, would be the last to claim for his fungus all the cases of blighting of crops which we are so fond of labelling as "takeall." Let us be thankful that such is the case, that we are now in a position to connect "takeall" with something definite and tangible; but let us at the same time endeavor to trace to natural causes such cases as do not fit in with the parasitism of the Wheat-stem killer. The case of No. 16 appears apposite to the purpose.

Here we have a well-grown field of wheat withering away to the extent of fully 50 per cent. of its plants within the brief period of 24 to 48 hours. Shall we conveniently dismiss the case as one of "takeall," or seek some more satisfactory explanation of the facts? My own view is that in this field many

diverging factors accidentally combined to bring about the downfall of the crop. We have, in the first place, the loose, porous texture of the soil, its open rubbly limestone subsoil, lending themselves to drying off very readily, notwithstanding an unusually wet winter and spring. There had been no rain of importance since October 3rd—that is to say, for a period of 20 days—amply sufficient to lead to the drying off of soil of this character. Then again, both in 1906 and 1907 this field had been very heavily stocked with sheep, at a rate that averaged out at 3·53 sheep to the acre for 24 months. We may assume, with Muntz and Girard, that in the course of a twelvemonth the excreta of a single sheep will represent the equivalent of 15cwt.s. to 16cwt.s. of farmyard manure; hence 3·53 sheep for 24 months would represent for Field No. 16 a dressing of sheep manure equivalent to 5½ tons to the acre or thereabouts—on the whole a rather heavy dressing for soil of this character, and likely to lead to the blighting off of a crop in the presence of unfavorable weather conditions. If to these facts we add the general tendency of weather conditions throughout the season to lead to rank, sappy growth, little else is needed to account for the sudden blighting off of a crop in the presence of a sudden and unexpected change in general weather conditions.

It seems certain, too, that wheat is peculiarly susceptible to blighting off at certain stages in the development of its grain; it is thus that in this field similar varieties sown at a later period, and therefore in a less advanced stage of maturity, almost completely escaped the general blighting off I have referred to.

HAY YIELD OF FIELD No. 16.

We were therefore compelled in this field to cut out for hay 23·66 acres that had been intended for grain; and from this area, notwithstanding the blighted condition of the crop, we eventually gathered in 65 tons 16cwt.s. 70lbs. of hay, which represents an average yield to the acre of 2 tons 15cwt.s. 67lbs.

FIELD No. 5A.

In this field between 33 and 34 acres were sown to a special ensilage crop. For reasons to be stated lower down this crop was not in spring-time sufficiently forward for the purpose, and it was in consequence reserved for hay.

The past history of Field No. 5A is briefly summarised below:—

1897..... Bare fallow	1906..... Hay (wheat, oats, and vetches)
1898..... Wheat	1907..... Bare fallow (limed)
1899..... Wheat	1908..... Partly ensilage (wheat, oats, and vetches) and partly barley
1900..... Bare fallow	
1901..... Wheat and oats	1909..... Partly hay (wheat, oats, vetches, and lucerne) and partly barley
1902..... Pasture	
1903..... Bare fallow	
1904..... Wheat	
1905..... Bare fallow	

Thus, after having been limed in 1907 at the rate of 1 ton to the acre, this field has now been under crop two seasons in succession. The western portion of the field, which carried barley and hand plots in 1908, carried the hay crop in 1909; whilst the eastern portion of the field, which carried ensilage crop in 1908, was under barley in 1909.

The 1908 stubbles were broken up with the disc plough in April and May. We experienced some difficulty in securing a suitable tilth for seeding purposes, with the result that seeding operations were delayed beyond what had been intended.

From April 29th to May 8th the following seed mixture was drilled in with 236lbs. of 36/38 superphosphate to the acre:—King's Early, 82lbs. to the acre; Calcutta oats, 56lbs. to the acre; Vetches, 10lbs. to the acre.

Immediately after seeding 6lbs. of lucerne seed to the acre was broadcasted and harrowed in.

This crop made very poor progress in the early portion of the winter, and anticipating temporary exhaustion of the soil as a result of the heavy barley crop of the preceding season (over 45bush. to the acre), I had it top-dressed with nitrate of soda and muriate of potash, at the rate of $\frac{1}{2}$ cwt. of each to the acre. The crop recovered very considerably after this treatment without, however, ever attaining to the rankness of crops grown on bare fallow.

HAY YIELD OF FIELD NO. 5A.

In this field 38.89 acres were cut out as hay, from which we gathered in 70 tons 12cwts. 91lbs., representing a yield of 2 tons 1cwt. 67lbs.

"NORTLE'S."

In this field, the total area of which is 220 acres, 51 acres were sown originally for hay. Portion of this area, as has already been stated, was cut out for ensilage.

This field was purchased for the College in 1896. Its general treatment since that period is shown below:—

1897.....	Bare fallow (partly)	1903.....	Bare fallow
1898.....	Wheat (partly), bare fallow (partly)	1904.....	Wheat
1899.....	Wheat	1905.....	Bare fallow
1900.....	Bare fallow	1906.....	Wheat and barley
1901.....	Wheat	1907.....	Pasture
1902.....	Pasture	1908.....	Bare fallow
		1909.....	Hay, oats, and wheat

The hay crop for 1909 in this field comprised in all 46.695 acres, and the greater bulk of this area—43.969 acres—was sown to the following mixture:—Calcutta oats (Mount Gambier seed), 60lbs. per acre; King's Early wheat, 100lbs. per acre; lucerne, 4lbs. acre; vetches (on 27 acres only), 8lbs. per acre.

This plot was drilled in with 236lbs. of superphosphate per acre between the 3rd of March and the 1st of April, and later on, between April 27th and the 1st of May, the seed mixture was broadcasted and scarified in. The Narbonne vetches came well, but, as usual, rendered hay-cutting much more tedious than a simple cereal mixture. The lucerne had not made sufficient growth at hay-making to swell the butts of the sheaves, but it grew very rapidly after stooking. Prior to the January thunderstorm it showed signs of withering, but this summer rain gave it a fresh start, and it developed into a really first-class stand, even for a lucerne-growing district. Of course the past season has been most suitable for the growth of green summer fodder, and consequently the 2s. 8d. to 3s. per acre spent in seed will this year be returned many times over, but such experience is not put forward as a criterion of what might be expected in an average year. It is yet to be proven definitely that this practice will form a remunerative system in this district over a period of years; nevertheless, the initial outlay is so small, and the probable returns so out of proportion to the cost in good seasons, that it seems to me to be worth any farmer's while to sow 4lbs. or 5lbs. per acre of lucerne each year on say 40 or 50 acres of the ensilage or hay crops. This will provide serviceable summer grazing for sheep, dry cattle, or mares and foals.

The cereals made very rank growth, and in parts went down rather badly, making hay-cutting very difficult. Probably this is due to the fact that the seeding proved rather heavy for such an exceptionally wet year.

A portion—1·467 acres—of the plot, carrying Liggowo white oats (imported from France five years ago), was cut for hay owing to the soil being so flooded and saturated that growth was seriously delayed; in fact, this portion of the oats was still quite green when the balance of the crop was ready for cutting. The seed was sown at the rate of 80lbs. per acre, and was drilled in with 236lbs. of superphosphate per acre on the 20th April. In addition to this plot there was a small block of 1·258 acres of King's Early wheat which was included in the hay harvest.

The total yield over 45·605 acres was 145 tons 15cwt., giving an average yield per acre of 3 tons 2cwt. 48lbs. It is only fair to say that had this field not suffered from the effects of prolonged exposure through winds, storms, and summer heat, the return would have been not less than 4 tons to the acre, and in considering the total yield the value of the lucerne-grazing must be borne prominently in mind.

“GRAINGER'S B.”

This field came into possession of the College in March, 1909. Its earlier history is not known, but at the time of purchase it was under bare fallow. The fallow, however, was covered with weeds, principally stinkwort, yet it worked down to fair condition at seed time, and was sown between the 8th and 13th of April with 236lbs. of superphosphate per acre and the following hay mixture:—King's Early wheat, 94lbs. per acre; Calcutta oats, 55lbs. per acre; vetches (over 8 acres only), 8lbs. per acre.

In all there are 45·151 acres in the field, and of these, as mentioned earlier, 3·999 acres were cut for ensilage, the balance—41·152 acres—being left for hay.

Of the area sown to wheat, oats, and vetches, about one-half was cut for silage. The mixture came away well at the start, and grew luxuriantly right through; indeed, from the bulky, strawy appearance of the crop, and the closeness of the stocks, it was expected that at least 3½ tons to the acre would be obtained. The total yield, however, was only 122 tons 5lbs. This works out at an average of 2 tons 19cwt. 38lbs. to the acre. This falling off is to be accounted for in large measure by the delay in completion of the harvest, for, as in the case of Nottle's, it was found impossible, owing to the exigencies of harvest, to lead this crop to the stack until long after it was due. In the face of such an exceptional season, however, it is not possible to run through the whole of the harvest without having to make some sacrifices.

GENERAL HAY RETURNS OF THE WHOLE FARM.

In summary, it may be said that, compared with former years, the hay harvest has been a good one—it has only once been exceeded during the last six seasons. The total area covered by the hay crops was 145·397 acres, and there was weighed off this area 404 tons 4cwt. 1qr. 26lbs. of fodder. The yield per acre, therefore, works out at 2 tons 15cwt. 2qrs. 12lbs., as shown in the appended table, which is included for purposes of comparison.

TABLE III.—*Showing Hay Yields on College Farm from 1904 to 1909.*

Year.	Rainfall. Inches.	Area. Acres.	Yields per Acre.		
			Tons.	Cwts.	Qrs. Lbs.
1904.....	14·70	93·0	2	11	0 22
1905.....	16·71	60·3	3	5	2 11
1906.....	19·72	93·0	2	11	3 6
1907.....	15·05	51·0	1	15	3 24
1908.....	17·74	112·8	2	7	0 5
1909.....	23·05	145·3	2	15	2 12

In comparing the seasons 1905 and 1909, consideration must be given to the fact that although the rainfall last season was nearly $6\frac{1}{2}$ in. in excess of that in 1905, yet this overplus is rather disadvantageous than otherwise, as it has resulted in a rank, coarse, flaggy type of growth that lodged badly, thereby interfering with the free running of harvest machinery and thus leading to material reduction in the yield.

Nearly 18 tons of hay were obtained from various headlands, &c., so that the total quantity put into stack for the year 1909 was 422 tons 1cwt. 3qrs. 31lbs.

BARLEY CROPS.

Throughout the season our barley crops, with the exception of some 20 acres of more or less waterlogged ground, looked magnificent. Eventually, however, they proved at harvest time somewhat disappointing. Why this should have been so I shall endeavor to show in the account of each individual field.

Barley crops were represented in the following fields:—Field No. 5A, Field No. 5B, Field No. 7B, and Field No. 8

FIELD NO. 5A.

The past history of this field has already been given in the account of the hay crop that portion of the field carried. It will be sufficient to recall here that the portion of this field under barley in 1909 carried in 1908 an ensilage crop (wheat, oats, and vetches). The ensilage stubbles were broken up with a disc plough in the course of April and May. Unfortunately the general texture of the ground is such as to have hindered considerably the task of working down this portion of the field to a suitable seed bed.

We sowed in this field two of our selected pedigree six-row barleys, Square Head (third selection) and Roseworthy Oregon (first selection). In both instances the field was drilled in on June 7th and 8th at the rate of 85lbs. of seed to the acre with 195lbs. of 36/38 superphosphate.

Growth in this field was, on the whole, very unsatisfactory, partly as the natural result of defective preparatory tillage, and partly as a consequence of waterlogging, arising from heavy winter rains, and the repeated overflowing of a neighboring dam.

The yields of the two plots are shown below—

Square Head barley (10.95 acres)	22bush. 30lbs. per acre.
Roseworthy Oregon (9.76 acres)	23bush. 44lbs. per acre.
Field average (20.71 acres)	23bush. 13lbs. per acre.

FIELD NO. 7B.

The past history of this field, as far as it is available, is shown below—

1897..... Pasture	1904..... Bare fallow
1898..... Wheat	1905..... Oats and wheat
1899..... Pasture	1906..... Pasture
1900..... Oats	1907..... Pasture
1901..... Pasture	1908..... Sorghums and maize
1902..... Oats	1909..... Barley
1903..... Rape	

The sorghum and maize sown as a fallow crop in 1908 made, on the whole, poor growth, and were fed down with cattle in the course of the summer. The field was worked over with a skim plough in March, 1909, and not cultivated again until June 10th and 11th, when it was worked up with cultivators before the drill. On the same dates it was sown to Square Head barley (third selection) at the rate of 82lbs. of seed to the acre with 195lbs. of superphosphate.

This crop, 22.3 acres in area, made throughout the season exceptionally fine growth, and I looked forward with confidence to a yield in excess of 50bush. to the acre. The standing crop, unfortunately, was somewhat damaged by rough weather before we were altogether able to get into it; not sufficiently so, however, to reduce the yield very materially.

In the end, however, the harvest returns were very disappointing. Instead of 50bush., as should have been the case, we secured only 28bush. 24lbs. to the acre—a very disappointing yield in the circumstances. Apparently the first touch of summer weather which made itself felt towards the end of October, and which has already been commented upon in connection with the hay crop, had the effect of blighting off this special variety of barley, not only here, but also in some other fields to be dealt with further on. The effect of the blighting off was very clearly shown as the grain poured out from the grader of the thresher, fully two-thirds of it appearing as seconds and thirds.

FIELD No. 8.

The past history of this field is shown below—

1902..... Bare fallow	1906..... Barley
1903..... Wheat	1907..... Pasture
1904..... Rape	1908..... Turnips
1905..... Pease	1909..... Barley

Thus this field has not been treated as bare fallow since 1902, and carried a good crop of turnips in the year immediately preceding this season's barley crop. This field, 24.87 acres in area, was broken up between April 26th and June 2nd. It was sown to two of our selected pedigree strains of barley between June 3rd and 5th. Both barleys were drilled in at the rate of 82lbs. of seed to the acre with 195lbs. of 36/38 superphosphate.

Under Short Head barley (2nd Selection) we had 17.99 acres, which yielded grain at the rate of 51bush. 19lbs. to the acre; under Square Head barley (3rd Selection) we had 6.88 acres, which yielded grain at the rate of 32bush. 48lbs. to the acre.

Here, again, the crop was somewhat damaged by rough weather, and the Square Head barley, as was the case in Field No. 7B, was blighted off by hot weather at a critical stage of its development, with the result that its yield was considerably below that of Short Head barley, on the whole a more hardy variety.

FIELD No. 5B.

This field was sown mainly to wheat, and we shall therefore leave any statement as to its past history for reference in connection with the wheat crops. It will be sufficient to state here that this field was treated as bare fallow in 1908, and that in 1909 three small plots were sown here to barley, the seed of which was secured from the 1908 Hand Selection plots. These two plots, therefore, are to supply us with farm crop seed barley for 1910. These plots were drilled in at the rate of 60lbs. of seed to the acre with 2cwt.s. of 36/38 superphosphate on May 10th and 11th. Details concerning yields are shown below.

	Per Acre.
Square Head Barley (4th Selection), 3.015 acres....	45bush. 11lbs.
Short Head Barley (3rd Selection), 2.330 acres....	53bush. 14lbs.
Roseworthy Oregon (2nd Selection), 2.045 acres....	51bush. 41lbs.

GENERAL BARLEY AVERAGE IN 1909.

Thus, in 1909, exclusive of a small plot of the permanent experiment field, we had under barley 75.27 acres, from which we harvested 2,634bush. 21lbs., representing a general average of 35 bushels to the acre. On the whole,

considering the circumstances and the season, such an average cannot but be looked upon as disappointing; but for unseasonable weather in October the average would have been nearer 50 bushels.

I append below in tabular form what have been our barley averages over the past six years.

TABLE IV.—*Showing Barley Yields on College Farm from 1904 to 1909.*

Year.	Rainfall. Inches.	Area under Barley. Acres.	Yields Per Acre.	
			Bushels.	Lbs.
1904.....	14·70	27·86	38	83
1905.....	16·71	65·73	25	4
1906.....	19·72	51·00	40	38
1907.....	15·05	79·30	31	21
1908.....	17·74	94·83	43	49
1909.....	23·05	75·27	35	0

OAT CROP.

In the field known as "Nottle's" about 23½ acres were sown to oats, which were reserved for grain. Of this area 19·83 acres were sown to Calcutta oats and 3·69 acres to Liggowe oats. The past history of "Nottle's" has already been indicated in connection with the hay crop sown in this field; there is therefore no need to repeat it here. It will be sufficient to note that the area under oats was treated as bare fallow in 1908.

The seed of the Calcutta oats was obtained from Mount Gambier, as I have always felt that in this district we are not, as a rule, in a position to raise good seed oats. I might add in this connection that if seed be secured from a relatively cold district such as Mount Gambier, the crop will, as a rule, be earlier and make more rapid growth, a point of very great importance, as a slow-growing oat crop is apt to become overgrown with weeds in the early portion of the season. The Calcutta oats were drilled in at the rate of 82lbs. of seed to the acre with 236lbs. of superphosphate between April 27th and 29th. Throughout the season growth was very satisfactory, and the yield ultimately 45 bushels to the acre.

The Liggowe oats—a white oat imported from France in 1904 and grown since then on the College Farm with only moderate success—were drilled in at the rate of 80lbs. to the acre with 236lbs. of superphosphate on April 20th. This oat made very fair growth, but was badly affected with loose smut, and yielded ultimately 35bush. 18lbs. to the acre.

Thus, on the whole, we reaped 1,022bush. 20lbs. of oats from 23 52 acres, representing 43bush. 19lbs. to the acre. Average yields of oats on the College Farm within recent years are shown below in tabular form.

TABLE V.—*Showing Average Yield of Oats on College Farm from 1905 to 1909.*

Year.	Rainfall. Inches.	Area under Oats. Acres.	Yields Per Acre.	
			Bushels.	Lbs.
1905.....	16·71	20·00	43	10
1906.....	19·72	33·5	41	18
1907.....	15·05	20·00	Failure from feeding off	
1908.....	17·74	20·00	22	28
1909.....	23·05	23·52	43	19

(To be continued.)

THE AGRICULTURAL BUREAU.

Conference at Georgetown.

The Eighteenth Annual Conference of the Northern Branches of the Agricultural Bureau was held at Georgetown on Wednesday, February 23rd. There were present—The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), the Assistant Director of Agriculture (Mr. A. E. V. Richardson), the Poultry Expert (Mr. D. F. Laurie), the Dairy Expert (Mr. P. H. Suter), the Government Bacteriologist (Mr. J. Desmond), the Acting Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), the Wool Expert (Mr. Spencer Williams); Messrs. J. Miller, A. M. Dawkins, and Mr. W. L. Summers (secretary), representing the Advisory Board; and delegates from the following branches of the Agricultural Bureau:—Beetaloo Valley, Balaklava, Caltowie, Clare, Crystal Brook, Georgetown, Narridy, Port Germein, Port Pirie, Redhill, Whyte-Yarcowie, Wirrabara, and Yongala Vale.

Mr. J. King (chairman of the Georgetown Branch) presided. He welcomed all the delegates, and expressed his gratification that the Minister of Agriculture had been able to attend.

THE MINISTER'S ADDRESS

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.), in opening the proceedings, said—"I am very pleased indeed to be with you to-day. I regard this conference of Northern Bureaus as one in which I am particularly interested, as I have been with you on various occasions before as a member of the Whyte-Yarcowie Branch. I might tell you that I believe that this is the first time since the Bureaus have had conferences in the North that a Minister of Agriculture has been present. I am not desirous of taking any particular credit for this, but I feel that a Minister of Agriculture wants to keep in touch with the agriculturists all over the State, and I can see no better way of doing that than by attending their Bureau conferences. We want to ascertain what the farmers are doing, and their feelings on this great industry of agriculture. One thing we can congratulate ourselves on is that the agriculture practised in South Australia to-day is not the agriculture practised in South Australia years ago.

"The Agricultural Bureau was brought very prominently before me the other day. The agricultural editor of an Australian newspaper called on me, and he congratulated me on two things. He said, "Firstly, you have the best *Journal of Agriculture* in Australia; and, secondly, you have a better system of imparting knowledge to farmers generally in South Australia than they have in the other States." That gentleman informed me that what he looked on as one of the strong points of our *Journal of Agriculture* was not so much the scientific articles that appear in it as the publication, in the reports of the Bureau meetings, of the ideas of the men on the land. These opinions and experiences of the men who are making their living on the land I regard as especially instructive, and I look on the Agricultural Bureaus as having been a most

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important factor in the improvement of the agricultural methods in South Australia. We must, however, give credit to the various teachers and professors of agriculture that we have had from time to time, but the interchange of ideas among the farmers by means of the bureau system has effected, as I said before, a great improvement in our methods of farming. The unthinking often attribute the present prosperity to the use of artificial manures. Artificial manures have played their part, but what is responsible in a greater degree are the better methods of cultivation—the more scientific methods—which now prevail. I believe, indeed, that the agriculture of to-day is as far behind the agriculture of the future as the agriculture that I first learned is behind the agriculture of to-day. We must not rest; we must be progressive, and willing to learn. Because we have not proved a thing we must not be conceited enough to think there is nothing in it. Let us try it first, and in all probability what did not appeal to us theoretically will eventually be found to be a success. I might also tell you that a short time ago we had an inquiry from New South Wales as to the working of the agricultural bureau system in this State, and we supplied them with full particulars. They have perceived the usefulness of the bureau, and are anxious to follow in our footsteps.

"The first thing that we can congratulate ourselves on this year is the splendid harvest we have had throughout the State. We cannot, of course, tell what the actual harvest results are, but, judging from the amount of wheat that I have seen on the railway lines and at the ports, I think that the forecasts are under the mark. The average yield at the Roseworthy College was something over 25 bush. to the acre. That, I think, is a good result in a year which at one period was not too promising.

"The Government of South Australia are spending a great deal of money in order to benefit the agricultural industry. I don't think we quite realise how much we are spending. If we take all that we are spending on the various branches of agriculture, and taking into account also that expended by the Stock and Brands Department, our bill is about £80,000 a year. When I first heard those figures I was surprised. Of course a great deal of that amount is earning something; we have Roseworthy College, Parafield, Kybybolite, Turretfield, and the Produce Export Depôt bringing in something, some of them not quite as much as they ought. I think the trouble about some of our experimental stations is that we are increasing our capital account too much; we are placing our officers under a big disadvantage by giving them everything they want. I say that is a disadvantage, because the best men are those who have had to fight their own battles, and if we had had our fathers to give us a good start and supplied us with exactly what we required the probability is that we would not be such good farmers as we are to-day. It seems to me not quite fair to the officers that they should be handicapped by having such a large capital account. What I am trying to do is to arrange for new demonstration farms to be worked in the same way as an ordinary farm is worked, and when I get requests for conveniences I am going to say, "I want you to try and make this farm pay for its own improvements." In this way you will get the true value of the experimental plots. I believe we have men in the department who can do this if they try.

"The formation of egg circles in connection with the department has received some criticism, but I want to say that in the Poultry Expert (Mr. Laurie) and in the Organising Secretary (Mr. Kinnear) you have two men who, if they are guilty of one thing, it is enthusiasm. Notwithstanding that the egg circles branch is a new department, with all the initial expenses, Mr. Kinnear reported to me that there is going to be a credit balance of something near £300 this year. The idea of egg circles is this: We not only find a market for the

eggs, but we find a market at a better price, and we provide our customers with a better article. A New South Wales paper recently stated that they could produce nothing in New South Wales equal to No. 1 South Australian Egg Circle eggs. We must look after these minor products. The time is sure to come, and we must not shut our eyes to the fact, that the land in South Australia is going to be held in much smaller areas than it is at present, and to make farming pay on the smaller areas it will be necessary to take advantage of all the auxiliaries, such as dairying, egg-producing, and industries of a kindred nature.

"No one can call me pessimistic in regard to agriculture in South Australia, and I believe that as we have overcome difficulties and solved problems in the past, we are going to overcome difficulties and solve greater problems in the future; and if Australia is going to be a great country—and I am confident it will be—it is going to be a great country because of its agricultural community. We must, however, remember this: that we must be prepared to learn. We have met to exchange ideas, to teach each other; and let us carry out that purpose to the fullest extent by keeping our minds open, and when we return let us try to carry out what we have learnt, and that is the way to become good agriculturists."

On the motion of Mr. B. Thomson (Georgetown Branch) a vote of thanks was accorded the Minister for attending and opening the Conference.

THE POULTRY INDUSTRY.

The Poultry Expert (Mr. D. F. Laurie) delivered an address on the poultry industry. He said he had been informed that it was impossible to put up clean eggs in the Georgetown district, but it had been done. In reference to egg circles he had been told that they would be unable to organise them in South Australia as in Denmark. Denmark was one of the poorest countries in Europe until the development of the poultry, dairying, and other so-called minor industries. Germany practically took up the egg circles system eleven years ago. In Denmark the organisation of the egg circles is the same in its object as in South Australia. He had found no place in South Australia in which he had been where the egg circles system, when fully understood, did not appeal to the people. Our exports for the last year amounted to £110,000, and the previous year to £127,000. He could not explain the difference in the amounts, but the producers had received more per dozen for their eggs last year than the previous year. Owing to the improvement in their methods, the better class of fowls kept, and more intelligence being displayed by the producers in getting their eggs to market in better condition, a better price for the produce had resulted. At the present time there was not an egg unsold in the egg circles stores. With respect to the financial aspect of poultry-keeping he could tell them that at Roseworthy, where they had to pay market price for everything, they had a gross profit of 8s. 1d. a bird, although some of the hens did not pay enough for their food.

Mr. Laurie explained the formation and working of the egg circles and the advantages which resulted from them. They did not want stale or rotten eggs. Each man could test his own eggs by making a hole the shape of an egg in a piece of stiff paper, placing the egg in position, and holding it up before a lamp. All eggs which showed a dark shade or black spots should be rejected. The proper packing of eggs in suitable boxes was very important. The great trouble hitherto had been the enormous breakages due particularly to defective packing. After a lot of trouble they had at last an egg box which was satisfactory. The eggs were placed in cardboard fillers and layers of wood wool placed on them.

The Poultry Expert gave a practical demonstration of egg-packing, and showed how difficult it was for eggs to be broken when properly packed. A most important thing in poultry-keeping was proper shelter. Very little shelter, however, would suffice, as fowls were remarkably hardy if they were housed and decently fed. He was sorry that the ravages of the foxes were so bad in the Georgetown district, but that was due to the fact that they did not give their fowls enough protection. If they did not provide proper accommodation for their fowls they would never be able to get rid of tick. It was quite a simple thing to put up iron houses for the poultry. He believed that it was possible to kill one-third of the hens in South Australia and yet make no difference to the egg production, because quite that proportion of the fowls was non-productive. As egg-producers White Leghorns were equal to anything. They were perfect egg-producing machines. For all-round fowls there were Wyandottes and the Black Orpington, pure breeds. It was nonsense to say that pure breeds were delicate. The Americans had declared for pure breeds years ago, and he would say unhesitatingly that in poultry pure breeds should be always kept.

Mr. Laurie was asked if he could recommend crossing Leghorns with Black Orpingtons. He replied that a good laying bird and excellent for table purposes would result. The cross, however, was not so good as the pure breed.

FARMING AS A VOCATION.

Mr. W. F. Nicholls (Narridy Branch) read the following paper on "Farming as a Vocation":—

"It is quite unnecessary for me in this paper to dwell upon the importance of the agricultural industry, for everybody will recognise that its success is the foundation of all real and genuine advancement the world over. But a fact not so generally recognised is the one that agricultural advancement depends to a very large extent upon the quality of the men engaged in the industry. It has long been thought by most of those unconnected with the agricultural industry that only the man of poor intelligence or the victim of unfortunate circumstances should make farm life his calling. This is quite a mistaken notion, as in few other walks in life is there so much scope for individual ability, or so much necessity for continual alertness and keenness of observation; and, what is more, no thick-headed man need think of turning his attention to the soil and hope to do very wonderfully thereon. But, on the other hand, the man who, with energy as well as ability, will turn his attention whole-heartedly to the cultivation of the soil is certain of a financially successful career as far as he himself is concerned, and he is of undoubtedly benefit to society as a whole. Let it be granted, then, that the kind of man who tills the soil decides to a large extent the return which that soil will give, the importance of inducing the best kind of man to be the farmer of the country will be apparent. My intention in writing this paper is, then, to prove, as best I may be able, that, although the farm has its manifest disadvantages, it likewise has its compensations and advantages.

"I must admit that at the present time we see signs of a reaction against the old-time idea that any sort of man was good enough to be a farmer, and that the youth of to-day is more disposed to turn his attention to the soil than was formerly the case; but a good deal of the reason for this is to be found in the fact that South Australian farmers have been passing through a period of almost unparalleled prosperity, and the popular idea is that farming is the only calling which is proving remunerative. There are, however, many young men leaving the towns whom we believe will turn out *bond fide* farmers. These

are mostly young men of energy and intelligence, and there can be small doubt that the step they are taking will be best for themselves as well as for their country. Those, however, who, through laziness or lack of ability, are a failure elsewhere had better stay where they are, because they will do no good in the country, and the country has no welcome for them.

" If anybody wishes to have proof of the fact that there is scope for brains on the farm, let him study the various farmers with whom he comes in contact, and he will find that almost without exception the most intellectual man is the most successful. The trouble is, however, that the promising young men are taught to believe that there can be no intellectual success away from the city, and consequently they are anxious to get to the large centres of population, where comparative failure so frequently awaits them. If those young men had remained at home on the farm they could have been very successful, and while books are so easily available the farmer has as good a chance to develop his intellect as the man in the town. On the other hand, the country man frequently develops the best sort of intellect, self-reliance, manliness, and a healthy individuality. The country boy often thinks that the greater amount of social life in the city will add to his enjoyment, forgetting that happiness springs from within, and does not come from some outside source. But there is no doubt that the social instinct of humanity has a great deal to do with the desire of the able young man to get to the town, and this is an instinct which should be combated, and the many advantages of the farm should be emphasised as a set-off against the dearth of social life. In the first place the farmer is not subject to the fierce and bitter competition which often falls to the lot of the men in most other walks of life. It is not a case with him of the few best succeeding and all the others failing. His products are always required, and if his neighbour has a better farm, or even if he farms his land a little better, and thereby produces more, he does not squeeze the less able man out of existence. Then again, the tradesman or the professional man who finds his business improving, or his profession proving more remunerative, is almost certain ere long to find some new opponent enter in opposition to him, and the ceaseless competition goes on. Not so the farmer. If prices rise he still has the same scope for his operations, or if he grows larger crops the size of his farm is not reduced. Another great advantage of an agricultural career is that it is almost absolutely independent. On his farm a man can go to work and do what he will, and do it in his own way, and in his own time, and has nobody to say him nay. He has not to cultivate a habit of obsequious bowing and scraping to secure the favor of a master or a customer, but in his own little domain he reigns an absolute monarch. To freedom-loving Britons this is no small advantage. Another advantage of being a farmer is that the man on the land has the greatest certainty of making a living. The earth has never yet been known to refuse to yield her increase; and let the farmer but recognise Nature's laws, and work in accordance with them, and he is certain of a greater or less return for his labor.

" Again, if the farmer has but eyes to see, his occupation is one of the most interesting. In most other walks of life those engaged in them are constantly doing over and over again exactly similar things, with scarcely any break in the monotony. But the farmer never does the same kind of work for many weeks together without a change, and there should be to him a never-failing interest in watching the growth and unfolding of plant and animal life. The life of the agriculturist is also an exceedingly healthy one, and health is a possession which is worth more than any of those things which mere money can buy. Good health, too, leads to happiness and lightheartedness, and these, I think, will be found to be characteristic of the South Australian farmer at any rate.

"The man on the land, to be what he should be, needs to make a reasonably good income, and to be able to do this he needs to own the farm which he tills. There are two or three reasons for this. The first is that if he is compelled to rent a farm he has to pay away too much of his farm's production to his landlord, and, what is more, his position never improves, for no sooner does he improve the producing capacity of the farm than rents are raised in sympathy therewith. You may wonder why I mention this point, but it is because the tendency is apparent for the land to get into fewer hands, and for the Australian farmer to become as his fellow is in most parts of the world—somebody's tenant. Now, a farmer who has to live in constant penury cannot be comfortable or happy; but if he owns the land he farms, and has the benefit of all the farm produces, he can provide himself and his family with a comfortable home, and can also secure for his children a reasonably good education. That he should be able to do this everyone will admit. That farmers should have a fairly good education in these days I think is essential. The farmer of to-day who hopes to make a success of his calling must be up to date in his methods, and this involves a considerable amount of knowledge. Farmers no longer plough with a single-furrow, broadcast their seed, and garner their harvest with a reaping hook, but they now work on scientific lines, and are guided in their work by skilful and well trained minds. That they are able to follow intelligently the footsteps of these men will in no small degree add interest as well as greater success to their work. Education also develops the intellect, and this in itself will help the farmer towards success. Our Australian system of farmer proprietors gives us, as farmers, the means whereby we can secure for ourselves reasonable advantages, and it is a system we should jealously guard as best calculated to secure a happy and prosperous rural population. The records of history show that farming is equally as well adapted for the growth of intellectuality as any other vocation in life, and, undoubtedly, the country atmosphere is calculated to develop the best men morally and physically. This being so, surely no young man with abilities of mind and body can be regarded as wasting these abilities by following farming as a vocation.

"There is no doubt that the personal element is what makes chiefly, if not altogether, for a state or nation's success or failure, and if the greater advantages which the agriculturist of to-day enjoys in the shape of more culture and lighter labor will induce more of the best of Australia's youth to go out on to her farm and pastoral country, and to wrest therefrom the potential wealth stored up, we need have no hesitation in saying that it will be the best thing for themselves as well as for the rest of the community."

The Assistant Director of Agriculture (Mr. A. E. V. Richardson, B.A., B.Sc.) said that the question of getting the people back on the land had been advocated by social economists for two or three generations, and no doubt it was the only solution to the problem of the over-crowding of the cities. There were four reasons why agriculture was a worthy vocation for all young men—(1) The comparative certainty of success; (2) independence of the farming life; (3) the fact that agriculture offers scope for the very highest intelligence of the nation—in America, particularly, it has been recognised that no amount of mental training was too much for the tiller of the soil; and (4), the hopefulness of the future. He believed that agriculture would ultimately take its rank as a profession, and absorb the very best intelligence and the very highest culture that the nation had.

A VETERINARY SURGEON FOR THE NORTH.

Mr. Thomas Dunsford (Redhill Branch) read a paper on "A Veterinary Surgeon for the North." He said that the need of a veterinary surgeon was

second in importance only to that of a medical practitioner, and in any appointment that was made they should see that a fully qualified man was selected. This was clearly a case in which the Government might intervene for the benefit of stockowners. He would recommend the appointment of an English veterinary, and he would leave the selection in the hands of the Royal College of Veterinary Surgeons and the Agent-General with strict injunctions to see that a competent man was chosen. If the appointment were made in Australia he would apply the same test as he proposed for an English appointment. He suggested that the officer should be stationed at Gladstone, and that his services should be made available for any locality within 50 miles of that town. He could then get to any part of his district in three hours. His services should be available according to the order of application, and in case of two simultaneous calls he could personally attend the more important one and advise in the other case by letter. The Government should supply him with all drugs, for which the farmers would pay at wholesale rates. The accounts to farmers might be issued through the Crown Lands Office or by a special clerk under the veterinary surgeon, and in case of all moneys remaining unpaid after the lapse of a month the debtor should be disqualified from all claims on the veterinary's services. Such an officer as he proposed should be paid £400 a year with quarters free. The Government should subsidise the amount raised in the district pound for pound until the officer became self-supporting at the rate, say, of 30s. per day. In the event of any special outbreak the Government should have a preferential claim on the officer's services.

Mr. F. Jenkins (Whyte-Yarcowie Branch) said that Mr. Dunsford had brought forward a question of great interest to stockowners and farmers in South Australia. The need for qualified veterinary surgeons had been felt throughout South Australia more during the last four or five years than previously owing to the high rates ruling for stock. He believed in getting the best man for the work without regard to where he came from. He thought that veterinary surgeons should not only be stationed in the North, but at various centres throughout the State.

Mr. S. Eyre (Georgetown Branch) was thoroughly in accord with the idea of having a veterinary for the North. He was dubious as to whether a man from the United Kingdom would be suitable for the purpose. He thought that a veterinary trained in Australia would necessarily be more conversant with local conditions and of greater value than one introduced from elsewhere.

Mr. H. Hawkins (Port Pirie Branch) was fully agreed with the proposal. He would be willing to consent to any reasonable scheme to support a fully qualified veterinary surgeon stationed in the North.

Mr. M. Walsh (Whyte-Yarcowie Branch) said he did not think it would be too much to ask the taxpayers to pay the salaries of qualified veterinary surgeons.

Mr. W. J. Colebatch (Acting Principal of the Roseworthy College) said he had experience of a veterinary in New Zealand who had been appointed on the guarantee principle, and the guarantors had the preference of his services, but the results had not been satisfactory, and he would not advise them to adopt the system in South Australia. The only rational way to deal with the question was to put the man on the same basis as they themselves were, and to let the Government subsidise him during the time that he was getting established. What they wanted was a veterinary who would come amongst them and settle, and if they gave a man a chance of settling amongst them he thought the scheme would be successful. He advised them not to be satisfied with only one veterinary, but to go for half a dozen for the North, and three or four for the South. The veterinary should receive a Government subsidy for, say, five years irrespective of

what he made, and if at the end of that time he had not a sufficient practice to depend on then the district in which he was did not require a veterinary surgeon.

Mr. J. Delmond (Government Bacteriologist) said that the whole matter of appointing a veterinary surgeon rested with the owners of stock—it was outside the Government altogether. They could get any number of veterinary surgeons from the other States if they liked to pay them. In Victoria alone there were 115 qualified veterinary surgeons, and in South Australia only five, and four of them were in the Government service. He advised them to form a committee and offer the veterinary a guarantee. The Stock and Brands Department was always ready to send an officer to treat stock diseases on application.

Mr. Summers said that the Minister of Agriculture had asked him to make it known that it was the desire of the Government that the services of the Government veterinary surgeons should be at the disposal of the stockowners throughout the State. At the conference held in Adelaide in September a resolution was carried asking the Government to appoint six veterinary surgeons practically on the lines that Mr. Walsh suggested, but the Government could not accede to that request.

LESSONS FROM THE HARVEST OF 1909.

The Assistant Director of Agriculture (Mr. A. E. V. Richardson, B.A., B.Sc.) delivered an address on "Lessons from the Harvest of 1909." He said that one of the outstanding features of the past agricultural season was the relative prominence given to the cultivation of wheat. That cereal represented 95 per cent. of the farm crops grown. There were four reasons why wheat was so popular in South Australia—(1) It was undoubtedly the best cereal to withstand drought; (2) a ready market could always be got for it—in regard to this he was glad to say that the price of wheat was likely to be higher in the future than in the past, owing to the fact that in America the production was gradually being overtaken by the consumption, and also owing to the substitution of wheat for rice as a staple article of food in the East; (3) the cultivation of wheat was easy; (4) the rapidity of cultivation and harvesting by means of improved implements.

The harvest of 1909, they had been told, was likely to be a record, and that something like 25,000,000 bush. would be realised. Such a figure had not been approached before in South Australia; but they must steadily press forward and bring about a harvest of 30,000,000 bush., and then 40,000,000 bush. That ideal could be achieved in two ways—either (1) by an expansion of the area under cultivation, or (2) by allowing the acreage to remain as at present and increasing the relative efficiency of each individual acre. He thought that the latter was the more desirable. It was doubtless the policy of the Government to do the former—opening up new lands by means of railways; but they, as farmers, should endeavor to improve the average yield of each acre. The question was, How could this be done? It could be done by more thorough cultivation, which meant two things—first, deep working, and, second, more frequent working. With respect to deep working, he did not advocate doing it on land where the subsoil was within 3 in. of the surface. That would be a fatal mistake; but in all cases where the soil was naturally deep it would pay well to plough and cultivate the land much deeper than had hitherto been done. The average depth of cultivation in South Australia was from 3 in. to 4 in. For every inch the land was cultivated 200 tons of soil were stirred up. That was brought up to the ameliorating influence of the atmosphere, and a far greater supply of soil fertility was built up. What was more important, however, in a district like Georgetown was the deeper the land was cultivated the better chance there was of storing up moisture. The conservation of soil moisture was the most important problem in South Australian agriculture.

The best results of deep working would not be realised the first year; they would be spread over a period of years. The experiments at Hammond would serve to illustrate the value of deep cultivation. At that place there was a block of 40 acres, containing eight plots of five acres each. The first plot was ploughed 6in. deep and was sub-packed, and the return in 1908 was 23bush. 4lbs. Alongside it was a plot ploughed 4in. deep, and also sub-packed, which gave a result of 17.42bush.—a difference of over 5bush. in favor of deep ploughing. Those 5bush. of wheat at the current price were worth £1, and it would only cost a little extra to do the deeper ploughing. In 1909 there were similar results. He believed that the Roseworthy College farm land had been ploughed regularly far deeper than the land in the immediate neighborhood, and he felt safe in saying that this season was a record for the college. At Parafield they never ploughed less than 6in. deep, and their harvest returns had been higher than they had been before. They tried to get the land at Parafield ploughed by July or August.

As to manures, it had been proved conclusively that it does not pay to grow wheat in most districts without the application of artificial manures. Most South Australian soils were deficient in phosphoric acid, nitrogen, and potash. Phosphatic manures could be obtained in two forms, soluble and insoluble. The insoluble forms were of very little use, and under our conditions there was very little chance of them becoming soluble and being used by the plant as food. Plants had to take their food in solution. In ordinary farming practice it would not pay to put on anything else except soluble manures. Practically the only form of manure they could use was superphosphate. The amount of super. to apply, would of course, have to be regulated by each farmer's own experience. As a rule the amount varied with the district; less manure was wanted for a dry district than a moist one because the water-soluble phosphate in it actually costs less than in the lower-priced manure.

Then there was the selection of seed wheat. The first thing in the selection of seed wheat was to get the variety of seed suited to the particular district. Two varieties of wheat grown side by side under exactly the same conditions often gave very different results. At Parafield this season Federation and Yandilla King were grown side by side; the former variety yielded 36bush. and the latter 30bush. A disease of wheat, known as "takeall," had been giving them some trouble in the Port Pirie district. This disease was due to a fungus, which did not affect oats very much, and it would be a wise policy to sow oats this year on the land which last season had a wheat crop which was affected with takeall. The department had conducted some experiments as to the relative efficiency of various fungicides for the prevention of bunt. This disease was likewise caused by a fungus, and always attacked the wheat plant just when it was germinating. In the tests which were conducted it was shown that bluestone interfered both with the germination and with the yield, whilst a compound called fungusine aided germination, and the wheat which was treated with it gave a better yield than that which was treated with the other mixtures.

Mr. Summers said one point in connection with deep-ploughing results at Hammond had not been mentioned. This was the rainfall, which in both years was unusually heavy for the locality, and this resulted in the soil settling down well. While he believed in deeper ploughing when the soil permitted, they required a somewhat dry season to see whether the same results would be obtained under the average conditions of the North. While he admitted that the higher grade super. was cheaper per unit of phosphoric acid than the lower grade he could hardly agree with Mr. Richardson that when considering which

brand to purchase this should be the deciding factor. He had known of a number of instances where the 30-32 per cent. super. gave just as good return as the 36-38 per cent., although this was not generally the case. Very little was definitely known about the action of manures, and he would advise them to test for themselves whether the cheaper grade would pay to use. Even when they used supers. of different makes, but of the same analyses, they got varying results showing that some unknown factors affected the yields.

CO-OPERATIVE SHEARING.

Mr. M. Coffey (Redhill Branch) read the following paper on "Co-operative Shearing as tried at Redhill, and its Advantages":—

"At the present time we see on all sides of us ample proof that co-operation in various directions is being largely adopted by numerous professions and callings, and, provided the principle is carried out on sound business lines, it must be to the best interest of the shareholders. 'Co-operation' is defined by a popular dictionary as 'a banding together of individuals for the purpose of protecting their interests.' This in actual practice must be sound. We see most professions going in very largely for co-operation, combines, and 'honorable understandings,' and surely the farmer and the sheepowner ought not to be blamed if, wherever possible, they adopt similar tactics. No other branch of farm work, to my idea, offers the same scope for the introduction of co-operation as does shearing. It was this idea that induced me last year to try and arrange for contract shearing in our locality; indeed, it must be plainly apparent to anyone who takes the trouble to look ahead that some change from the old order of things is not only desirable, but, I might say, absolutely necessary. Look around our own part of the State, and how many young men do you find learning hand-shearing at the present time? I think you will say, 'Few.' I say it is a fact that we have reason to be proud of and feel thankful for, because the same class of young men who learnt shearing a few years ago are now more inclined to launch out and make homes for themselves and those depending on them. I feel sure no one would wish them to remain in the district for a few weeks' shearing if they could do better elsewhere. Perhaps you will say they might do worse, but that is their own business—not yours or mine. Someone may say that if a scarcity of hand-shearers is likely to occur in our State, the same may occur with regard to machine-shearers; but I answer, 'No,' because our local young men, who formerly learnt hand-shearing, can now devote their time to better advantage, and then, as regards the company's employés, they can be drawn from one part of the Commonwealth to another, so that the same hitch is not likely to occur. Then again some growers may say, 'I have an oil engine at the present time. What is there to prevent me installing one or two machines and doing my own shearing?' I might reply and say, 'There is nothing to prevent you doing so except your own common sense.' Remember that shearing machines, as at present constituted, are not worth anything unless there is an expert to superintend the running of them, and the grower who would try the experiment would very likely be found later on looking up history to see how many generations had come and gone since the man and the ass parted company. When we proposed introducing the scheme at Redhill there were not wanting those who prophesied that we were on the right track for making a complete mess of things. It was said we would bitterly regret doing so; that we would get our wool torn to pieces by the company's employés; that we would get our sheep boxed, and very likely get boxed ourselves; that we were running local men out of work when at the same time some of those making the remarks knew perfectly well the supply of local labor was not equal to the

demand. However, our members were mostly men who were favored by Providence with a reasonable amount of brains, and consequently knew what they were about. An agreement was entered into between our members and the Federal Sheep-shearing Company—an agreement strictly fair to both parties. Our members were considerably hampered by the continual changes of weather during shearing time. The company on their part did all that was possible under the circumstances. Their men arrived on the scene on the very day agreed upon some three months before, and I am sure that, if we had had normal climatic conditions, the 20,000 sheep at the Heydon Depot would have easily been dealt with in three weeks. I must give a word of thanks in passing to the owner of the shed, Mr. Wheaton, who not only placed his most up-to-date shed, yards, and all necessities at our disposal, but who was always ready and willing to assist us in every way he possibly could. To Mr. James Browning, the manager, a word of praise is also owing for the skilful manner in which he discharged his duties. Before I enumerate the advantages possible under contract shearing, allow me to tell you of one mistake we made, and a mistake which had very far-reaching influences. The team sent on by the company were able to average easily 1,000 per day, and we could only place under cover about 700 sheep. With the numerous flying showers during shearing time we were continually in trouble. Had we been able to house, say, 2,000 sheep instead of 700, not only would it have meant that our shearing would have been through in half the time, but a better class of work would have been done, for where there are too many breaks in work of this kind the men are inclined to get out of stride, and perhaps try later on to make up for lost time. This generally ends in a certain amount of friction that might under more favorable conditions have been avoided. Now permit me to refer to a few of the advantages the scheme offers. At the Heydon Depot last season a few of the growers had about 1,000 sheep, which meant one day's work. At the price we were paying this meant a cost to the owner of £27 1s. 8d. For this amount the grower had his sheep yarded up, shorn, his wool prepared by an expert classer, sorted, baled, dumped, and weighed, or, to put it more plainly, the owner of 1,000 sheep, the shearing of which was started in the morning, was privileged to sit and watch his sheep being shorn, his wool classed and baled; and, had his team been available, it would be quite possible for the grower to take his 1,000 sheep and his load of wool away from the depot in the evening. Look at the other side of the picture. What are the conditions under the old style? You pay about £12 10s., you board your men, you must either provide extra labor or leave your teams idle, you spend several days fixing up your shed each year, your clip is classed anyhow or nohow, for it stands to reason you cannot in handling wool for a week or so in the season have any idea of the conditions required. The same number of sheep which could be shorn in a day at the depot take you anything from a week to two weeks. Every evening you will be required to yard those sheep, and only sheepfarmers know what that means. But supposing we grant you that under the different systems a saving of £14 11s. 8d. is apparent in the case of the hand system, what about boarding your men? What about extra labor or the loss of a week's work with your team? What about knocking your sheep about for a week or more to do what could be done in a day? What about keeping lambs away from their mothers, sometimes for several days? Indeed, I feel sure that if you view the question of contract-shearing calmly and deliberately, you will be forced to admit that it is a distinct advantage over the old system. I have not the slightest doubt in my own mind but that the classing of the wool by an expert means an increased price, sufficient to cover the whole cost of shearing. This theory might not be easily proved, but the truth of it will be borne out by almost every independent wool expert. In conclusion,

I feel sure that in a few years we will see in general use in all wool-growing districts the system of contract-shearing, which has been introduced and carried out by the enterprising growers of Redhill."

The Wool Expert (Mr. Spencer Williams) said he would like to make a suggestion to the Georgetown Branch of the Bureau, and that was that they should form a class of students for wool-classing similar to the classes which were formed in other parts of the State. He explained the system of the classes, and the advantages which would result from the formation of one at Georgetown.

STOCK AILMENTS.

The Government Bacteriologist (Mr. J. Desmond) gave an address on "Stock Ailments." He said it was a great mistake to break in colts at 18 months and give them hard work to perform. The animal that was broken in at 18 months was practically useless when seven years old. He deprecated the practice of cracking horses' teeth. When the horse was not doing well it would be far better to give it change of food than to break its teeth. The less horses' teeth were interfered with the better. The only thing that should be done was to take the sharp corners off. Water should be given to the horses before feeding, and on account of the peculiarity of the horse's stomach, food should always be given in small quantities. Oats built up the muscles and did not cause thickness in the wind.

Mr. Desmond, by means of diagrams, explained the construction of a horse's stomach and other internal organs. He showed the part of the horse's organs where bots attach themselves. What would remove the bots would kill the animal. The only way to prevent bots was to prevent the flies laying their eggs underneath the chin of the horse. This could be done by burning off the hair or rubbing oil or grease on the chin. Colic was another complaint he would refer to. To prevent a horse from getting colic it should be given as much water before feeding as it wanted, but after feeding the animal should not have water.

THE PIG.

The Dairy Expert (Mr. P. H. Suter) delivered an address on "The Pig." He said that in all countries dairying had been associated with pig-raising so as to make the former industry more successful. There was a shortage of pigs in this State as well as in every State of Australia. Victoria alone was short to the extent of 150,000, and South Australia from 22,000 to 35,000. Pig-raising was a successful industry when intelligently managed. The pig was not a dirty animal; it was one of the cleanest of animals. A pure-bred boar was essential on the farm. Well-bred pigs commanded several shillings per head more in the market than mongrels. They need not be afraid of paying five guineas or even ten guineas for a good boar. The pig that was most in favor at the present time with bacon-curers and those in the pork business was a cross of the Middle York sow with the Berkshire boar. Special care should be given to the housing of the pigs, and the animals should be well fed. Milk was very largely responsible for the great amount of tuberculosis that was prevalent in pigs, and consequently he would recommend that the milk should be pasteurised by being brought to a temperature of 180° for 10 minutes before being given to the pigs. Barley was undoubtedly the best food for pigs. There were great possibilities before the pig industry in South Australia, and it was a highly profitable business.

SCIENCE AND AGRICULTURE.

Mr. A. E. M. Dawkins (Advisory Board) said that science was playing a most important part in the farming of the present time. A farmer wanted to understand something of veterinary science, something of botany, and some-

thing about the chemistry of the soil. He thought the Government were pursuing a wise policy in sending out to the various congresses trained experts—and they had to-day a fine staff of experts—to give advice to the farmers.

"THE JOURNAL OF AGRICULTURE."

Mr. J. Miller (Advisory Board) said that the opinions which were published in the *Journal of Agriculture* of the practical men who were on the land were of great value. It was a splendid way of imparting agricultural knowledge.

IMPROVING OUR SEED WHEAT.

Mr. Summers (Secretary of the Advisory Board) said he thought no work on the farm offered a more certain financial return than the improvement of seed wheat. He believed every farmer could, by careful selection and experiment, increase the average yield of his farm by 2bush. or 3bush. per acre. Most farmers appeared to be under the impression that this work would take up more time than they could give to it during harvest; but this was not so. While the crossing of wheats must of necessity be left to the experiment station officer and a few enthusiasts in this work, every farmer should try to improve his wheat by selection. If this were not done their wheats were bound to deteriorate; in fact, it would not be difficult to mention a score of varieties which had deteriorated to a very marked extent through neglect in this direction. With a view not only of providing supplies of pure, selected, seed wheat, and at the same time interesting the rising generation in this important work he desired to offer a suggestion for the consideration of members of Branches. Let the Branches in a district contribute a substantial prize to be competed for at the local show by young people not over 18 years of age for selected seed wheat. The conditions of the prize to be that the competitors shall make their own selection of seed, and the prize to be awarded to the one growing the greatest quantity of grain on a given area, say 50 sq. yds.; the prize wheat to become the property of the Branches, and other entries to be subject to right of purchase at a price to be agreed upon. In this way they would obtain clean, pure seed specially selected to suit local conditions, and arrangements could then be made to grow it for general distribution. The prize would need to be a substantial one, say £5 5s.; but he was certain it would be money well spent. The exhibition of the products of these small plots at the local show would also prove of great interest. At present it was practically impossible to secure from the farmer pure, clean, seed wheat, but the carrying out of his suggestion would overcome this difficulty.

APPOINTMENT OF VETERINARY SURGEONS.

Mr. T. Dunsford (Redhill) moved—"That in the opinion of this Conference it is advisable that qualified veterinary surgeons be appointed at selected centres throughout the State, and that such veterinary surgeons be subsidised by the Government on a scale sufficiently liberal to ensure the appointment of first-class men."

Mr. G. F. Jenkins (White-Yarcowie) seconded.—Carried.

FUTURE CONFERENCES.

Mr. W. R. Wright (Port Pirie) proposed that in regard to future conferences an executive committee be formed, consisting of a president, secretary, and three members—one of the latter always to be the secretary of the Branch where the next conference was to be held. The functions of this committee would be to keep the Branches in touch with each other and the department, and to collate matters of interest for each conference.

After a discussion it was resolved that matters remain as at present.

It was resolved that the next conference be held at Whyte-Yarcowie.

NOTES ON LUCERNE GRAZING.

By S. McINTOSH, Manager of Murray Bridge Irrigation Farm and Chairman of Irrigation Board.

In the article on Lucerne Harvesting published last month I inadvertently omitted to mention the necessity for a bed of dunnage, either timber or dry straw, below lucerne stacks to prevent the moisture from the soil rising and damaging the bottom layer of hay. This factor should never be forgotten in stacking.

GRAZING.

It never pays to graze a first-class lucerne crop. The plant gives its silent protest to having its crown constantly eaten out by stock. Unfortunately a high percentage of lucerne-stands fails to reach the A1 class, and in such cases it is often more economical to judiciously graze than to harvest the crop in the orthodox manner.

VARIETIES MOST SUITED FOR GRAZING.

Less than a generation ago the average farmer was quite satisfied to sow wheat, almost irrespective of its variety or quality. Drought, red rust, bunt, and various pests were looked upon as necessary evils, which nothing could mitigate or overcome. To-day the up-to-date and successful wheat-grower grows a semi-drought and rust-resistant grain, suited to the local natural conditions. Bunt is with him practically unknown, added to which his average return per acre, as compared with the past, shows a decidedly substantial increase. The alfalfa-grower of to-day, if he desires to pose as a first-ranker, must sow Hunter River, and, when he has purchased what purports to be such, at a price of from 6d. to 9d. per pound in excess of other varieties, he is satisfied that he has done the correct thing, and unless success follows he concludes that lucerne-growing is a failure.

The rapidly increasing demand of the past few years for lucerne demonstrates what phenomenal yields of seed are apparently realised, despite damage by heavy floods, in the famous Hunter district. The failure of the average seedsman to guarantee his commodity as true Hunter River leads one to suppose that possibly he is being duped, and that imported seed, which under its true name can be purchased at about two-thirds the price of Hunter River, is being sold as the latter.

Steps are now being taken, both in Victoria and South Australia, to determine by a series of practical tests the true values of the different varieties imported, and the results, so far as the tests have gone, are decidedly encouraging, more particularly from a grazier's point of view. Arabian, which is a much coarser seed than the ordinary type—unfortunately there is none on the market to my knowledge at present—is fully justifying the statements made by American authorities that this variety gives one crop per annum ahead of any other. This season the growth for the first nine days after cutting more than doubled the South Australian, Hunter River, Turkestan, Peruvian, Provence, and American varieties. Turkestan, which is the next on the list of early growers, can be purchased at a price very considerably below

that charged for the fashionable variety; and, in view of the facts that the former is the hardier sort, that it costs less, and that grazed fields usually fail in from three to five years, would-be graziers will be more than justified in sowing Turkestan, provided they secure a guarantee the seed is free from dodder. Another early and free grower is Provence. Personally, I have seen quite as much dodder in crops grown from reputed Hunter River as from all the other imported varieties combined. Graziers should sow Prairie or other free-growing grasses suited to their respective districts with the lucerne—about one of grass to three of lucerne. Cut the first growth, after sowing, when it is coming into bloom. If the crop is very light leave it on the ground as a mulch; otherwise cart it off for feeding elsewhere. Feed off the second growth lightly. This treatment will give the plant a fair start in life, and ensure a more successful and lasting "stand."

SIZE OF GRAZING PLOTS.

Avoid continuous grazing, or depasturing comparatively small flocks on big areas. Much of the growth becomes old and fibrous, and is left by the stock; while again a high percentage of the plants are either killed out altogether, or seriously checked through the crown being constantly nibbled clean. The system we have found most economical is small paddocks which can be grazed off in from three to six days. Due regard must be paid to the ditches and banks when putting up the temporary enclosures, and the land should be irrigated at least a week prior to its being stocked. The flower should be commencing to show before the stock are turned on. From one-quarter to half a mile of pig-netting, 3ft. high, 8in. or 4in. mesh, and 12 gauge, with 1in. angle-iron droppers 4ft. 6in. long, and used every 7ft. or 9ft. makes an ideal sheep fence, which can be erected and removed with a minimum loss of time and expenditure in labor. The droppers should have a slit cut into one of the flanges an inch from the top, and must be pointed to facilitate their being driven into the soil. The netting is unrolled and stood on edge along the line of the intended fence; the dropper is then warped through the top, centre, and bottom meshes and driven home with a wooden maul until the top of the dropper is within an inch or two from the top edge of the netting. The netting is then raised and dropped into the slit, which must be cut downward so as to prevent the wire slipping out of place.

Unless sheep have been used to lucerne, before they are turned on to the crop they should be allowed to fill themselves with their usual feed, dry grass or straw for preference. This reduces the risk of their becoming bloated. Depasture as early in the season as possible, provided the growth is not damp or wet with dew or rain, for a start; then keep them on the plots, unless the weather becomes too wet, or a change of feed is desirable. It is advisable to have, if possible, a paddock of *Phalaris communata*, African Wonder, millet grass, *Paspalum dilatatum*, or other suitable and hardy grazing grass available for such contingencies.

DANGERS FROM "BLOAT," AND REMEDIES.

"Bloat" is the most serious trouble to be feared by the grazier. The most dangerous periods are early in the season when rains and dews are common; on particularly mild and balmy days, either early or late in the season; during the latter end of March or April, if there are early rains; and through the winter in the event of there being any comparatively warm weather to maintain a fairly free plant growth. Old sheep appear to be more liable to the trouble than young stock. This is also the experience recorded in America. Sheep require but little water whilst feeding green lucerne, except in the event of

extreme heat. Still it should always be available, as it serves to check the trouble under review. When stock are noticed to be affected, if they are still on their feet, drive them around briskly. I have known a good trot around for a quarter of an hour to save a mob of cattle, without any further remedies being necessary. If the trouble is too far advanced for this treatment, take hold of the tongue, pull it well forward, and either smear the root of it with Stockholm tar, or else throw about a teaspoonful of carbonate of soda or common salt down their throat. With cattle use a treble dose, and add a gag made from a piece of a broom or fork handle, with a strap or rope over the head to hold it in position. Should even this prove ineffectual, or should the case be a serious one from the start, the trocar and cannula should be brought into use. Assuming the beast to be lying down, first tie a string of several yards in length to the cannula, so that in the event of the animal rising you have a chance of recovering the tube without trouble. The proper place for the insertion is half-way between the point of the hip and the last rib. Drive the trocar downward and forward until the flange of the cannula rests on the skin, then withdraw the trocar. This permits a free escape of the gas, unless the cannula becomes blocked, which it seldom does. If it should it can easily be cleared of the obstruction. If possible, smear the wound with Stockholm tar after the cannula has been withdrawn. After a few lessons the average grazier can use a clean pocket-knife and a straw or reed just as effectively as the beginner does the trocar. Half a pint of warm or sweet milk is recommended by some as a sure cure for bloat-affected sheep. Other remedies referred to by Coburn are—

1. Blankets wrung out of cold water and wrapped round the abdomen or belly, or cold water dashed on with a bucket.
2. Two ounces of turpentine for adult cattle and $\frac{1}{2}$ oz. for sheep, well diluted with milk.
3. Hyposulphite of soda—1 oz. for cattle, and 2 drachms for sheep, dissolved in water and given as a drench. This can be repeated every half-hour for two or three doses.
4. Aqua ammonia—2 ozs. for cattle and $\frac{1}{2}$ oz. for sheep, well diluted in water.
5. Carbolic acid—Cattle, 30 drops; sheep 8 to 10 drops, in sufficient water.

Ordinary care must be observed in giving drenches.

The following points are recommended to graziers and intending graziers:—

1. Sow suitable grasses, with lucerne seed, on lands intended for grazing.
2. Cut the first growth; do not eat it off.
3. Irrigate at least a week before stocking.
4. Use small enclosures which can be grazed off in less than a week.
5. Lightly graze the second growth when flowering.
6. If possible keep water available for stock.
7. Give stock a full paunch before turning them on to the lucerne.
8. Don't remove them at night unless the weather is very wet.
9. During wet weather not only do stock puddle the soil and foul the ^{water} but "bloat" risks are increased.
10. Mark all stock showing signs of "bloat," and if affected again ~~are~~ ^{are} removed from the lucerne area.
11. The greater the size of the barrel in stock the less liable ^{they are} to "bloat."
12. Have suitable quantities of Stockholm tar, carbonate of a few gags available on the spot. Also carry a sharp and clean
13. To cut at least one crop of lucerne (flowering) per annum value and life of the plot.

14. Lucerne land intended for grazing should be particularly well graded and drained to secure the maximum results.

15. Cultivate with a disc harrow (set straight), a spading harrow, or a lucerne cultivator, approximately in May and August.

16. After the first cultivation apply from half a ton to a ton of lime or gypsum per acre on grazing plots over one year old.

17. Manure during the winter according to the requirements of the soil and the crop.

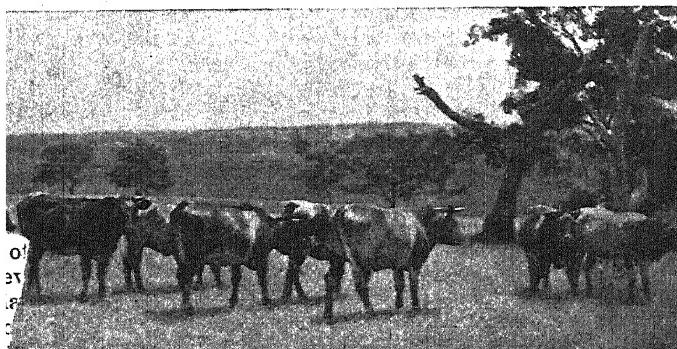
18. Use as much humus as you can possibly get hold of on grazing land.

19. Keep a close watch over the first year's operations, and practice common sense principles. This should ensure success in the end.

Personally, I do not recommend grazing cattle on irrigated lucerne, as they puddle the ditches and drains and break down the banks and run more risk of bloat troubles.

PIGS.

Lucerne is a splendid swine pasture. Netting, similar to that used for sheep, only 6in. or a foot lower, with a 3in. barb wire strained along the bottom and fastened to the foot of the dropper makes a suitable enclosure. Graze on the same lines as for sheep. Plenty of water, both for drinking purposes and as a wallow, should be available in convenient places. Store pigs and weaners thrive remarkably well on lucerne alone. When preparing for "topping-up" a grain ration of from 1lb. to 2lbs. per day gives particularly satisfactory results.



MARKETING OF SOUTH AUSTRALIAN PRODUCE.

Lectures by the Trades Commissioner.

(Continued from page 604, February Issue.)

MUST FIND MARKETS.

"We have here, as is generally admitted, the finest country in the world for the production of poultry and eggs, but it is no use at all excepting for fancy purposes unless you can find markets. While at home I used to read the Australian papers very carefully, and I noticed that during the last three years I have been away it was said, 'You don't want oversea export'; that, for the present, anyhow, the Commonwealth could absorb all the eggs laid in South Australia and the other States. Well, if the Commonwealth can do that, it is all right. I am not prepared to say it cannot; but many facts point to the contrary. It is not a compliment to the other States to say they are not progressing too. Again, we are a progressive country. If we can supply now—and over-supply—what is required for the other States at the prices you are getting, surely we shall produce a lot more as time goes on? The value of the export trade last year was £120,000. What is that by the side of America's output, which totals the enormous amount of \$600,000,000 in value, or 30s. per head of a population of 80,000,000? That is America right round, and we know quite well that parts of America are nothing like as suitable as Australia for the raising of poultry. The other States of Australia are equally able to raise poultry as we are. Therefore, what greater encouragement can you give them than to keep prices high here? Take a retrospective view. In November, 1894, eggs were 3½d. per dozen, less 5 per cent., in Adelaide—good, stale, dirty, small or large, all one price, and at no period from September 4th to November 30th in that year did the price exceed 4½d. per dozen. With eggs at such prices, one could not wonder that 'poultry doesn't pay.' It is evident that the supply was far greater than the demand, and that an export trade was necessary. Eventually inter-State trade opened up, and prices accordingly advanced till in October and November, 1902-3, 8½d. to 9½d. per dozen was obtained in Adelaide. This state of affairs, however, did not continue very long. South Australia's production was annually increasing, and the other States in their turn were becoming more self-supporting. As evidence of this, in 1905 eggs were again as low as 5½d. per dozen at public auction in Adelaide.

COMMENCEMENT OF THE EXPORT TRADE.

"It looked then as if we were once more going to get back to lower prices, because production was beginning to exceed even the inter-State demand—it was more than what was really required. From my own personal experience I know that a considerable amount of business was carried on in that

year at a very great loss, because the prices quoted in Sydney and Western Australia, and the rates that ruled in Adelaide, certainly showed no margin for packing. Then it was asked—‘What are we going to do next year, when probably the prices will be still lower and the production greater, while the demand of the other States, which are beginning to be self-supplied, will be falling off?’ Producers began to say ‘We must look for an outside market.’ That had been suggested before; I was asked in 1906 to speak before an association in Adelaide, at the School of Mines, and address a meeting of farmers at the Exhibition Building at the time of the September show in that year. I pointed out the necessity for going in for poultry keeping, and urged them to look further afield than the Commonwealth for markets.

EXPERIMENTAL SHIPMENT TO LONDON.

“As a result of that meeting in September, 1906, a deputation waited on the Commissioner of Crown Lands and asked him if the Government would guarantee the freight on a shipment of eggs to London. Should the answer be favorable, then we were to go ahead and see if we could collect the necessary number of cases to fill a chamber in the ship. The Commissioner agreed to the request of the deputation, stating that he quite realised the importance of the industry, and that, unless something were done to get an outside market, the industry must finally collapse with its own weight. That was a reasonable way of looking at the matter. If we were going on producing with the markets getting less the industry must break down. The request of the deputation having been acceded to, I received instructions, as Manager of the Produce Export Department, to collect these eggs. At that particular time I noticed several long letters in the press condemning the whole system by saying it was absolutely impossible to send eggs to England, and that it was so much waste of money by the Government. It was also stated that certain firms had tried the experiment of exporting eggs and that it was an absolute failure. Those letters made matters seem pretty black for me, coming as they did from people who ought to know something about the subject they were writing about. I asked several gentlemen to support me, and some were very kind and took rather a compassion on me. One man gave me 25 cases of eggs, but said, ‘Believe me, Major, those eggs will not be worth 5d. per dozen when you get them to London. We tried the experiment long ago, and I was in London when the eggs arrived, and they came out of the cases like custard.’ We had some idea of the cause of the failure of the various shipments, and had experimented at the Government Depot as to the proper temperature required, so that we were pretty sure we knew how to manage the shipment. A chamber was secured in the R.M.S. *Britannia*, and that historical shipment of eggs got away on November 1st, 1906. The eggs arrived in London on December 10th, 1906, and I met the steamer. I went down to Tilbury and saw the eggs come out of the steamer. I did not go on board, because the P. & O. Company said they would not have Government agents on the vessel inspecting. When the eggs were lowered on to the wharf I had several cases opened, and was delighted to find the eggs, to my mind, quite as good as on the day they were put into the case. I had the cases placed in a lighter and taken to the cool store, where the eggs were further examined. They were in tip-top condition. ‘Now is the time,’ I said to myself, ‘to make a name by selling them at a good price.’ I was a stranger in big London, and had heard a lot about Tooley Street people. I interviewed a dozen of them. The first time they said to me—‘Australian eggs are no good. You can’t bring eggs from Australia here. Look at these eggs from Russia, at such-and-such a price.’ I found out something right away about Russia.

THE SUPPLY FROM RUSSIA.

"England was importing £7,000,000 worth of eggs annually, and I thought Australia should send some of them, seeing that Russia supplied very nearly half the quantity imported. Well, I went into the conditions of the Russian supply when I visited the country later. What I found was that the majority of the eggs put on the English market in December was placed in the cold store in Russia in May, June, and July. Leaving out the time taken by carriage, that meant the eggs were six months old when they reached England. I also found out that the majority of the eggs did not reach the cool store until after a journey lasting as long as three weeks—and sometimes in Russia it is quite warm enough. If you put a stale egg into a cold store it is not fresh when it comes out. So I came to the conclusion that we had not much to fear from Russia. There was a fairly heavy supply of Russian eggs in London, and I had seen some of them before I interviewed the importers. I was beginning to feel that the question, 'What am I to do?' must be answered. I saw they were against me, and did not want to do business. I interviewed, quite on the off-chance, some of the largest retail distributors. It was quite a criminal thing to do that. You must always let the middleman have a few bites first. I interviewed a particular retail firm, and found out that they got through an average output of 1,500,000 eggs a week. That was just about big enough for us, I thought. The firm was anxious to see if they could buy produce direct, bearing a Government ticket. I do not mean to imply that it is absolutely necessary for the Government to mark everything, but that any produce can always be sold easier if it has a Government certificate. I told the head of the firm that our eggs were not more than four days old when put into the chilling chamber. I took it that the producers of South Australia would not have sent older eggs, as the circular distributed amongst them had warned them against doing so. That was in contrast with the facts that the Russian eggs were three weeks old when put into the cool store, and that they remained there six months. The gentleman I was interviewing said he would like to see our eggs, and I told him at length about infertile eggs. He did not believe anything about them. I told him that infertile eggs would never go bad. There is no need to tell you of this theory, but not one of the egg merchants would believe it. So when I had said that an infertile egg would not go bad as an ordinary one would, I added that it would probably desiccate and evaporate, but not go rotten in the ordinary sense of the word.

A CRITICAL TEST.

"I sold that lot of eggs from South Australia, and we secured a net return of 6½d. per dozen for that historical shipment which, I was told, when it left Adelaide, would not realise 5d. in London. An important point to be noted is that during the time the eggs for this shipment were being sent into the Depot, the Adelaide market price was 6d. per dozen, less the usual selling commission. I felt confident that we had established the fact that we could ship eggs from Adelaide to London satisfactorily. That was the thing the producers wanted to know. You have established this fact—that if eggs are ever likely to go down to 5½d. again, you have a remedy. I wish to point out that these were sold to a retail firm. One of the first things the head of the firm said to me when I reached London was, 'You have a very fine country, but in many respects it is only a country of samples. If we take this shipment of South Australian eggs up, can we rely on a constant supply? Because we are getting a constant supply from our present source, and we don't want to take up your eggs and then have to go back to the old source.' I assured him

that such a progressive country as this, having once put its shoulder to the wheel, would never go back, and that he could always rely on getting a constant supply of eggs for the Christmas trade from South Australia. Next year I wanted eggs particularly, because I had told him they would be forthcoming. Two shipments came along the next year and averaged a net return to the producers of 7½d. per dozen. A year or two before it had been said, 'If we could always be sure of 6d. per dozen we would be highly satisfied.' Last year I wanted more eggs. This man saw me again, and said, 'I suppose I shall be able to get more eggs for Christmas?'

AN OPPORTUNITY MISSED.

"In London you can get a very good idea as to what the world's markets are, and in September, 1907, I found out that the supply of eggs in Riga and other parts of Russia was very limited, and that there was not the slightest doubt that we were going to have a very scarce supply in London. That was good enough to cable out, and I also cabled the fact that this man was guaranteeing a price that would net 7d. per dozen, Adelaide, for all eggs sent. Probably South Australian producers would have obtained a better price had they shipped any. Subsequent events proved, when no eggs came, that if they had sent them they would have netted something like 8½d. or 9d. I understand the reason eggs were not shipped was because of the high price of 8d. per dozen ruling locally. I know nothing about the causes of these high prices, except what one sees in the press, that it was the inter-State demand, and not speculators, buying the eggs and putting them in pickle. The reason the price kept up last year and thus knocked the export trade to England on the head was because the inter-State demand was clearing the markets. That is what they say. I suppose that is right; but, even so, is it going to last? You have opened a channel in England at great expense and after much trouble, and are you going to let the trade slip right away and lose the best customers because of the high price locally? I wonder is there anything in the fact that it is known right throughout the Commonwealth that the whole of the surplus eggs can be shipped to London? Has that anything to do with the keeping up of the local price? I made a statement to the effect that probably a lot more eggs had been bought up and put into cold store to keep the price high in November, and that probably the price ruling in May and June would not be quite as high as in previous years. I notice that last month (June) eggs were 3d. per dozen lower than for the corresponding month of last year. I think if you clear your surplus out of the Commonwealth you are bound to have better prices in the season when eggs are scarce. Apart from that, is it not better to have British capital in the country than eggs. If you send £20,000 worth of eggs out of the Commonwealth you have that amount of English capital well circulated. I say it is far better to get that surplus right outside the Commonwealth and have imported capital here rather than pickled eggs. In any case the export trade should be looked upon as a means of maintaining local prices at all times. What would happen with your lamb, butter, and apples if you kept them all in the State?"

POULTRY-RAISING.

"There are great possibilities in Australia for raising poultry, and you have energetic people in South Australia. I think if you review the industry you will find that a vast amount of interest is being taken in poultry right throughout the Commonwealth. The other States are taking a very keen interest in poultry-raising, particularly Western Australia. Feed is very much less in

price in Western Australia than it used to be, and there is one of our principal outlets that, in my opinion—and I gather my opinion from gentlemen in that State who know—will soon be self-supporting. We are not giving undue credit to New South Wales when we say she is progressing in the same way. At a not very distant date New South Wales will be closed to us, or, if not closed, the demand will be very low. Then, what are you going to do with your surplus? Is the poultry industry of South Australia to collapse, or to follow on with an export trade? We can now supply goods straight from Adelaide to a large retailer, and that is a thing that, if you had suggested it in London five years ago, would have caused laughter at your expense. If you dared to give over to a retail man stuff direct you would be boycotted all round. This one particular firm is prepared to take all the eggs we can produce, but we must assure them that they can get a constant and regular supply.

METHODS OF PACKING.

"In regard to methods of packing I would like to say a few words, because I went closely into that subject. When the first shipment from here was sent to London we did our best in the Depot to ensure that the eggs were carefully graded and packed. They were all well graded and packed, but there were a few faults. Experience teaches, and we learnt. I believe, after careful consideration on the matter an inquiry right through the various markets on the continent of Europe and also in Canada, that we have got the very best methods of sending eggs to England. Our experiments have been encouraged by the company who control the Blue Anchor Line of steamers. We had eggs packed in the latest way for the Franco-British Exhibition, and not five in the case were unfit for use. I think we have overcome that difficulty and now, as regards packing, temperature and carriage, I do not think we have anything else to learn.

GRADING.

"A word or two about grading. In England I was on the verge of being laughed at when I told them that we sold eggs in South Australia at so much a dozen irrespective of weight. Hardly another country in the world does that. Every egg is sold in England and on the Continent on grade. If a man has 15lbs. or 16lbs. eggs and another 18lbs. and upward, he necessarily gets more who has the higher-graded eggs, and less is paid, of course, for the smaller eggs. I was very satisfied with our last grades. From 15lbs. to 16lbs. were the medium weights, and others from that upwards were heavy weights, while there were also smaller eggs. You can find a market in England for eggs of every size. There was an idea once that nothing smaller than 2oz. would do; but you can sell any size of egg in England, if you are prepared to take a price accordingly. I also found a market for egg pulp, which gives another great facility in that we are enabled to dispose of the smaller eggs and those that have been cracked. Thus you are in a better position to ship eggs than ever before.

ORGANISATION WANTED.

"Of course it is too early yet to say what the market in England is going to be this season, but very probably it will be good. Before we ship we shall know better what supplies are held in Russia. I do hope that when the time comes for us to call for shipments this year (for we are certainly going to ship, because we must keep our connection), that you will assist all you can with your influence, or in any other way, to get the shipment together. I know the argument used is, 'Why should I ship my eggs to London and probably only get 7d. and let my neighbor get the benefit by selling his in

Adelaide at 8½d?" I quite agree with you that you must have organisation. I know some of you have been a little more patriotic than others on this particular question. But here's the point—you want organisation. I went to Denmark on purpose to find something out about this organisation, and I am glad to say I think I have the whole thing at my fingers' ends. I spent a considerable time there, got right in underneath, and found out what was being done. I learnt that 30 years ago Denmark was one of the poorest countries of Europe, and I found that to-day she is one of the wealthiest, so far as produce is concerned. Co-operation amongst producers is the secret of success. On that account Denmark has been made one of the richest producing countries in the world. The principal bacon and butter factories, and the egg-collecting depots are run on co-operative lines. There is organisation. I wanted to see how this egg business was worked. Danish and French eggs will fetch in London the highest price, next to fresh-laid, of any that go there. They have in Denmark what are known as circles right throughout the country, with a head depot at Copenhagen.

EGG CIRCLES.

"Pretty well every man who has a chicken at all belongs to a circle, subscribes so much, and conforms to its rules. He supplies his eggs to the circle, the circle officials examine them, and then they are passed on to the head depot. The returns are sent to each circle from the head depot, and the members get their dividends. Every member of a circle is supplied with a rubber stamp. For instance, he is No. 6 of No. 7 Circle. These numbers he stamps on every egg he sends in. Each egg is examined, and he is credited by the secretary with the good eggs; but if he brings in bad ones he is fined, and may be expelled for repeatedly doing so. The eggs are sent down to the head depot at Copenhagen. If there are any bad ones they are put on one side. When all have been examined they look at the bad ones. They might say, 'Here are half a dozen bad eggs from No. 6 of No. 7 circle.' No. 7 circle is then advised that so many of No. 6's eggs are bad, and he is debited with them. By that system even at the head depot they can trace every bad egg back to the producer right throughout Denmark. I am of opinion that this system that obtains in Denmark and some other countries to-day can just as easily be carried out in South Australia. I do not expect everybody to agree with me, but before we say it cannot be done let us try. Some people said we could not send eggs to London. Well, we have sold a large number in the last two years. Three years ago, I undertake to say, the general opinion was that you could send neither eggs nor honey to London. I say we ought to have a try at this circle business, and before we say it cannot be done we ought to try. That is one of the main things I want to press home to-night. If you realise the importance of the poultry industry you must begin to think that one of the finest countries for the production of poultry will never go ahead unless we get organisation right through the State by having these circles properly established. One man cannot do it. We must have the co-operation of everybody interested in poultry, and we should, I think, look to clubs who are interested in the breeding of poultry. The Government has again come to the assistance of the producers. The Minister of Agriculture (the Hon. E. H. Coombe) has authorised the formation of co-operative egg circles throughout the State. The success or otherwise of the scheme now rests entirely with the producers themselves. The organisation is in the hands of competent men, and all machinery for working is as complete as possible; but, unless the eggs are forthcoming, the result cannot be successful. Under the proposed scheme the producer takes no financial risk. He has

everything to gain and nothing to lose. All he is asked to do is to exercise a little more care in the methods of collecting the eggs. Under the circumstances it behoves everyone to very carefully weigh the whole matter and look ahead. It may not be out of place to reiterate the following points for special consideration :—

“ 1. How very easily the inter-State market can be over-supplied, particularly when the production is yearly increasing in each State; and the time is not far distant when at least two of the States will be self-supporting. With no other outlet it will probably mean eggs 3½d. per dozen once again.

“ 2. In England the demand is increasing and supplies falling off. Official figures show the shortage of supplies for 1908 to be 64,000,000 eggs. With the English market open to us we could increase our production tenfold without fear of a glut.

“ 3. Individuals cannot successfully ship to England for reasons already stated. Co-operation is essential, and when the circle system is complete each circle will take its proportion of the quantity to be shipped to England, thus preventing large quantities of eggs being pickled and reappearing on the market in the winter months.

“ 4. Every case of eggs shipped to England means so much more outside capital to the State.

“ 5. The experimental stage of shipping to England is over. We know exactly the class of package, packing, and temperature that is necessary, and the cost of transit and other charges ; we know also just where we can place the eggs.

“ 6. The little extra trouble necessary to comply with the circle regulations will be more than compensated for by the increased price obtained for the eggs. Already buyers both in Sydney and Adelaide are offering 1d. per dozen advance on ordinary market rates for eggs collected under circle conditions.

“ 7. Is the present ‘ strong demand ’ about which we hear so much for immediate consumption or the pickle-tub ? Is the pickle-tub in the interest of the producer ?

THE FLOOD-TIDE OF THE POULTRY INDUSTRY.

“ Export to England undoubtedly means that the local consumer will have to pay higher prices for eggs than heretofore, hence an incentive for a greater production—the object to be attained. I am well aware that this scheme has been adversely criticised as unnecessary, unworkable, and so on. What new undertaking ever did run smoothly at first ? There is some satisfaction, however, in the knowledge that the same gentlemen who to-day are loud in their condemnations are the same who three years ago emphatically stated it was not only unnecessary, but impossible, to send eggs to England—unnecessary because the inter-State markets could take at satisfactory prices all the eggs produced in South Australia. At that time eggs were 5½d. to 6d. on the Adelaide market, and evidently the possibilities of further production in the State never struck them. Some have said the Government has no right to interfere in these matters. It is not within my rights to express an opinion in regard to any action the Government may take ; but I think I am quite justified in pointing out the fact that for a number of years many of the merchants in Adelaide and of the storekeepers in the country have not been satisfied with the existing system of marketing eggs, and have on more than one occasion endeavored to bring about an alteration, but without success. With the scheme under review, it is not the intention of the Government to deal in eggs, but to assist in organising a system that will eventually be self-supporting and controlled by the producers themselves. The Central

Board will be composed of independent business men, the Government reserving the right of inspection. In speaking as I have done, without any personal interest whatever in regard to this important industry, it is from a purely national standpoint, and without any desire to cast a reflection on anyone. I have had a wide experience not only in this but in other countries in regard to poultry production and marketing, and am convinced that production of poultry in this State can be increased to a very great extent with a minimum of expense and trouble. All that is required is the incentive. The incentive in most business propositions is £ s. d., and I think that with proper organisation there is £ s. d. in poultry. Probably this movement is the flood tide of the poultry industry in South Australia. Will the producers 'take the current when it serves' by joining co-operative egg circles? Look a little way ahead. Even now inter-State markets report business dull, and in some places non-operative. What would be the result if every person keeping poultry in South Australia were to increase his stocks of poultry by 10 per cent. only? And that could easily happen without individually noticing it.

POULTRY FOR THE LONDON MARKET.

"The export of eggs is more important than that of poultry, but I have made a lot of inquiries in London and on the Continent as to how birds should be packed, what should be their weight, and so forth, and I am glad to say that in Adelaide you backed me up to a great extent by sending along to England two years ago a very fine little lot of poultry. We realised, I think, something like 1s. per pound in London. The question, however, is not what we are going to get for a few cases of fancy stuff. That is rather a misleading idea. We want to get at this—at what prices in London will it pay us to rear poultry and fatten them (as they should be fattened) for the London market? We should not take into serious consideration the prices realised for one or two shipments that reached there at an exceptional time. We want them to arrive there in March, April, and May—that is, chickens or ducklings. It does not matter what quantities you send, you will realise 8d. per pound. When you are going into this thing in a big way consider the lowest price it will pay you to do it for. Then I think it will pay all right. If you are going to send home large quantities and take the market year in and year out 8d. per pound is what you might look for as the lowest price. You may strike, as has been done on a few occasions, 10d. or 1s. It is the same in the case of ducklings. That little lot sent home two years ago was really fine. I showed them to several retail buyers, and they were bought by the same firm which purchased the eggs. I reported on the matter and next year wanted more. They came along. I didn't show them to the retail firm, but put them up to public auction. They were not properly prepared for the English market. I am not condemning the whole shipment. Some of the ducklings were good, but some of the chickens were not good. You must keep up the quality if you want to make a name, and if you want to get a price you must make a name for yourselves. The shipment was not all bad, then, but generally it was not up to that of the previous season. When some of the smaller chickens were submitted to the head of the retail firm he said, 'Why, they are hollow-ground.' He was comparing their breast-bones to razors. It is no use sending stuff like that to England.

ROOM FOR IMPROVEMENT.

"This year all the poultry that came home, generally speaking, was really good. There is, of course, room for improvement yet, and it seems to me that people here who have taken interest in this matter and backed up my recom-

mendation from England deserve great credit. Because it is all very well to say, 'We don't want an export of poultry from the country'; but you will later on, if you are going on progressing; and the best way to induce it is by sending good stuff. Great credit is due to those who sent last year, because they kept the channel open, and the poultry was very good. Certain improvements are needed, and I carefully noted them, in conjunction with Mr. Pope, and I also remembered what was pointed out by the head of the firm which bought the consignment. I understand that is the sort of information you want from the Trades Commissioner. Well, you have it, and next year we shall probably still go ahead and improve on the last shipment. If you do that you are going to have a constant and lasting trade in England for poultry, particularly when you can get right to the big retailer. If he knows he can rely on South Australia at that particular time of the year for really good poultry—certainly the condition will affect the prices—you are always certain to get better rates than if you had to throw them on to the open markets. I think I have given you the past and present position of the export trade. Now I am certain that if this great industry is to go ahead as it should do with the opportunities afforded, you must look for outside markets. No one else in any other country would tell you you could go ahead without looking for such outlets. We have 4,000,000 and more of population and I do not believe, and I do not think the people believe, that we cannot raise more poultry than will suffice for our own needs. You would not be here to-night if you believed that. Our producers are progressive, and I think, more progressive than in any other country. It is only a question of bringing the means before them, and showing them there is profit in the industry. I must appeal to you to give some assistance in getting away a shipment this year.

CHICKENS AND DUCKLINGS.

"I do not know what was the age of the chickens we sent to London, but those that arrived there last year were exactly the kind required as far as condition and age were concerned. I think the proper age is about 13 or 14 weeks. The best weight is up to 3lb. or 4lb. As regards ducklings it does not matter so much. Of course you must remember I am not a poultry expert. The larger the ducks the better, but you do not want to be too big for fowls. They want white-feathered ducks for London. It is not necessary to have white-feathered chickens. A tremendous lot of the best poultry for the market is Plymouth Rock. I can emphasise one thing—they don't want poultry with black legs."

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, February 9th, there being present Messrs. J. W. Sandford (Chairman), Col. Rowell, C. Wilcox, J. Miller, G. R. Laffier, A. M. Dawkins, and W. J. Colebatch.

The Secretary reported that owing to unavoidable circumstances it would not be possible to arrange for trial of stone-gathering machines in February. The Northern Yorke Peninsula Bureau Field Trial Society had agreed to make the necessary local arrangements, and March 16th had been suggested as a suitable date. This date was approved, and it was decided to ask the judges at the previous trial to act again. It was also decided to suggest that it be a stipulation that the prize-winning machines be exhibited at the September Show.

The Secretary reported that the Hon. Minister was seeking the co-operation of the other States in the matter of a thorough investigation into the cause of "bitter pit" in apples.

It was resolved that the members of the Board provide a prize of £3 3s. for the third-year student at Roseworthy College considered to be the best outdoor worker.

Approval was given to the formation of Branches of the Bureau as under :—At Frances, with the following gentlemen as members :—Messrs. M. Watts, W. Pycroft, D. Barrett, G. Smith, J. McGillivray, S. M. Valentine, W. Tompkins, S. C. Meehan, A. J. Baldock, B. F. Feineler, W. Jarred, J. C. Brown, H. Smith, D. Smith, W. H. F. Coats, J. Townsend, A. J. Canacher, F. H. G. Pfitzner, F. A. Holmes, F. Smyth, and D. Flavel ; also at Mitchell with the following as members :—Messrs. F. T. Miller, W. A. Dorwood, M. McCormac, D. Green, J. Green, E. Jinkin, A. Molloy, G. A. Vigar, R. Sampson, W. Sampson, jun., D. Sampson, W. Ness, W. A. Gregory, E. T. Gregory, A. C. Gregory, H. W. Gregory, A. C. Gregory, and G. Langford.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. F. Ridley, T. Goodall, W. Frost, F. Frost, H. Bussenschutt, and H. Webb, Salisbury ; T. Maynard, Clare ; J. Messenger and J. Cameron, Lameroo ; A. Whip, Coomooroo ; W. Thompson, Tatiara ; J. Miller, Morphett Vale ; W. Tregilgas, Meningie.

Bordertown Branch advised that the date for holding Conference of Branches had been fixed for April 12th.

The Secretary reported that the letter received some time ago from the Port Elliot Branch asking the Board to consider the question of selling cattle by live weight had been referred to the Master Butchers' Association, the Metropolitan Abattoirs Board, and the Metropolitan Stock Salesmen's Association. Replies had been received from each body. The communication from the lastnamed was merely in the form of an acknowledgment. That from the Acting Secretary of the Abattoirs Board stated that, "as far as can be ascertained, the general opinion is against cattle being sold by live weight. Weighing machines were in use in many places in Europe, but the cattle are led on to them, which is impossible here. The method suggested would be too costly. Two large automatic weighing machines would have to be installed, each capable of weighing and automatically registering over 3 tons weight, and with the class of cattle sold here they would soon get out of order. The bulk of the cattle from the Far North and Queensland and the owners from those places seem satisfied with the present method of selling. The cattle sent in from Port Elliot district are mostly sold locally or at Strathalbyn." The Secretary of the Master Butchers' Association (Mr. W. G. Kelsh) wrote—"Your letter was laid before my board, and I was instructed to advise you that they consider that the present method, i.e., on estimated weights, is the better for buyer and seller, considering the variety of quality and condition of cattle sold in the market, and that value does not follow weight so much as quality. Therefore, the fact of seeing the weight would not assist the buyer nor add to the value of the beast."

Mr. H. C. H. Denton forwarded model of spikelet of oats obtained by him while in England, and which he thought might be useful at the Roseworthy College in teaching the boys. The model was much admired for its completeness and accuracy, and Mr. Colebatch stated that it would be very useful to the teacher of botany. It was one of the best models of this class he had seen, and he would like to see a complete set at the College. A hearty vote of thanks was accorded to Mr. Denton for his gift.

Mr. J. Miller referred to the prevalence of "takeall" which had spread practically all over the country. Steps ought to be taken without delay to ascertain the cause of it, and how it might be prevented. It was pointed out that Professor Angus had promised to furnish a report on the subject, but so far had not done so. Mr. Colebatch said Mr. McAlpine, of Victoria, was the only person who had really investigated the disease in Australia in recent years, and he had published a bulletin concerning it. The true "takeall" was caused by a fungus, but the difficulty was that there were so many different causes of wheat going off, all known by the name of "takeall." After further discussion the Board resolved to ask Professor Angus for his report on the subject.

THE WHEAT MARKET.

The month of February was distinguished for a very heavy wheat traffic on the railways and very large shipments from all the principal ports. In sympathy with the London market the price, which at the beginning of the month was about 4s. 2d., fell gradually to 4s., which is just the reverse of what happened last year, when prices firmed during February from 3s. 8½d. to 4s. 1½d. Last year the price advanced during March to 4s. 6d., but the London market does not give much promise of a similar favorable turn this year; indeed, the following extract from *Beerbohm's Evening Corn Trade List* of February 4th points in the opposite direction:—"The wheat market has been exceedingly quiet this week; prices have gradually eased off day by day, and there has been more pressure to sell on the part of Argentine shippers than for a long time past. Australians have been also freely offered, and, in fact, most descriptions of wheat are now obtainable at about 1s. under the prices ruling last Friday. Buyers have made little or no response, and, as a consequence, very little business has been done. The present level of prices, apart from the last two years, is above the average of recent years, and so long as the prospects of the growing crops in Europe and America continue favorable buyers will most likely pursue a hand-to-mouth policy. The latest official Argentine crop report estimates the surplus for export at 11,000,000qrs., or about 1,000,000qrs. less than actually shipped last year. Private estimates point to 10,000,000qrs. as a more likely surplus; even the smaller quantity would mean that there is a very large quantity of wheat to be handled, and, whatever may happen later on, it is pretty certain that farmers at the commencement of a new season will be desirous of selling a fair proportion of their crop, and consequently arrivals at the various Argentine ports are likely to be quite liberal for some weeks to come, although probably smaller than in either of the two previous years. The exports to date are already 1,410,000qrs. less than in the corresponding period last year, so that if the surplus is not more than 2,000,000qrs. less than in 1909 most of the shortage in the total Argentine shipments this year is accounted for, and exports during the remainder of the year would be very little below last year's figures. This year, however, Argentina is not the same dominating power as in the two previous years, owing to the fact that there is plenty of Russian wheat still to be bought, very much more than was the case in 1909 and 1908. In a few weeks' time, if nothing untoward happens to the crop, Indian wheats will in all probability be competing more freely with other descriptions. Shipments from all countries to European destinations in the six months ending January 31st were very large, viz., 33,820,000qrs., against 27,575,000qrs. in the same period of the previous season, and this must have resulted in a fair increase in stocks, in both first and second hands, as compared with the small reserves held at the commencement of the present season. From August 1st to the end of January the net imports of wheat and flour into the U.K. were 11,900,000qrs., against 10,030,000qrs. in 1909, an increase of 1,870,000qrs., but the supplies of English wheat were 3,110,000qrs. against 3,820,000qrs., a decrease of 710,000qrs.; leaving a net increase this year of 1,160,000qrs. The weather since harvest has on the whole been very unfavorable for threshing, and this may have had something to do with the supplies of English wheat being smaller than last year, notwithstanding that the crop was officially estimated as being 1,100,000qrs. larger than the previous one. A great deal of the wheat was stacked in a damp state, and required a good spell of cold and dry weather to condition it. The American markets have been much more uncertain in their movements recently and have apparently lost much of the bullish feeling that was so noticeable up to the end of last year. Present indications are for some further weakening in prices, but any material damage to the growing crops would alter the situation considerably."

Date.	LONDON (Previous Day).			ADELAIDE.			MELBOURNE.			SYDNEY.		
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.
Feb. 7	—	—	—	4/1 $\frac{1}{2}$ to 4/2	4/1 $\frac{1}{2}$ to 4/2	4/1 $\frac{1}{2}$ to 4/2	4/1 to 4/1 $\frac{1}{2}$ h.	4/1 to 4/1 $\frac{1}{2}$ h.	4/1 to 4/1 $\frac{1}{2}$ h.	4/1 $\frac{1}{2}$ to 4/2 $\frac{1}{2}$ s.	4/1 $\frac{1}{2}$ to 4/2 $\frac{1}{2}$ s.	4/1 $\frac{1}{2}$ to 4/2 $\frac{1}{2}$ s.
8	Quiet ..	..	..	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/1 ..	4/1 ..	4/1 ..	4/1 h.; 4/1 $\frac{1}{2}$ to 4/2 s.	4/1 h.; 4/1 $\frac{1}{2}$ to 4/2 s.	4/1 h.; 4/1 $\frac{1}{2}$ to 4/2 s.
9	Do. ..	..	..	4/- to 4/0 $\frac{1}{2}$	4/- to 4/0 $\frac{1}{2}$	4/- to 4/0 $\frac{1}{2}$	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/0 $\frac{1}{2}$ b.; 4/1 to 4/1 $\frac{1}{2}$ s.	4/0 $\frac{1}{2}$ b.; 4/1 to 4/1 $\frac{1}{2}$ s.	4/0 $\frac{1}{2}$ b.; 4/1 to 4/1 $\frac{1}{2}$ s.
10	Steady, quiet ..	..	..	Do. ..	Do. ..	Do. ..	4/1 b. ..	4/1 b. ..	4/1 b. ..	4/1 to 4/0 $\frac{1}{2}$ b.	4/1 to 4/0 $\frac{1}{2}$ b.	4/1 to 4/0 $\frac{1}{2}$ b.
11	Jun. 4/11 $\frac{1}{2}$ ..	..	..	Do. ..	Do. ..	Do. ..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.
12	Steady ..	..	..	Do. ..	Do. ..	Do. ..	4/1 $\frac{1}{2}$ to 4/2	4/1 $\frac{1}{2}$ to 4/2	4/1 $\frac{1}{2}$ to 4/2	4/- to 4/1 b.; 4/1 $\frac{1}{2}$ s.	4/- to 4/1 b.; 4/1 $\frac{1}{2}$ s.	4/- to 4/1 b.; 4/1 $\frac{1}{2}$ s.
13	— ..	..	..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	4/1 h. to 4/1 $\frac{1}{2}$ s.	4/1 h. to 4/1 $\frac{1}{2}$ s.	4/1 h. to 4/1 $\frac{1}{2}$ s.
14	Very firm ..	..	..	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	Do. ..	Do. ..	Do. ..	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
15	Steady and quiet ..	..	..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.
16	Feb. 4/11 (safer) ..	..	..	Do. ..	Do. ..	Do. ..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/2 s.	4/2 s.	4/2 s.
17	— ..	..	..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..
18	Firmer ..	..	..	Do. ..	Do. ..	Do. ..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	4/1 $\frac{1}{2}$..	Do. ..	Do. ..	Do. ..
19	Feb. 4/10 $\frac{1}{2}$ to 4/11 ..	..	..	Do. ..	Do. ..	Do. ..	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	4/0 $\frac{1}{2}$ to 4/1 $\frac{1}{2}$ b.	Do. ..	Do. ..	Do. ..
21	— ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/2	4/1 to 4/2	4/1 to 4/2	Do. ..	Do. ..	Do. ..
22	Feb. 4/11; steady ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
23	Jan. 4/11 ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
24	Very weak ..	..	..	Do. ..	Do. ..	Do. ..	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	Do. ..	Do. ..	Do. ..
25	Dull ..	..	..	Do. ..	Do. ..	Do. ..	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	Do. ..	Do. ..	Do. ..
26	Dull and neglected ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
28	— ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
Mar. 1	Steady, quiet ..	..	..	Do. ..	Do. ..	Do. ..	4/1 ..	4/1 ..	4/1 ..	Do. ..	Do. ..	Do. ..
2	Feb. 4/10 $\frac{1}{2}$ ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1	4/0 $\frac{1}{2}$ to 4/1
3	Feb. 4/10 $\frac{1}{2}$; 4/1 $\frac{1}{2}$ Liverpool ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
4	Dull, and offered lower ..	..	..	Do. ..	Do. ..	Do. ..	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	4/1 to 4/0 $\frac{1}{2}$	Do. ..	Do. ..	Do. ..
6	Steady, quiet ..	..	..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..	Do. ..

STREAMER FREIGHTS.—Parcels, Port Adelaide to London or Liverpool, 21s. 3d. per ton (6d. per bush.). full cargoes, Australia to United Kingdom—Continent, from 25s. per ton (8d. per bush.) to 21s. 3d. per ton (6d. per bush.); Port Adelaide to Melbourne, 10s. per ton (3d. per bush.); Port Adelaide to Sydney, 13s. per ton (4d. per bush.).

SAILER FREIGHTS.—A little business was done at 21s. 3d. per ton (6d. per bush.) to United Kingdom—Continent; and 18s. 6d. per ton (6d. per bush.) to South Africa.

RAINFALL TABLE.

The following table shows the rainfall for February, 1910, at the undermentioned stations, also the average total rainfall for the first two months in the year, and the total for the two months of 1910 and 1909 respectively:—

Station.	For Feb., 1910.	Avg'e. to end Feb.	To end Feb.-b.	To end Feb., 1910.	To end Feb., 1909.	Station.	For Feb., 1910.	Avg'e. to end Feb.	To end Feb., 1910.	To end Feb., 1909.
Adelaide	0·06	0·60	0·08	0·96		Hamley Bridge	—	0·49	0·35	1·19
Hawker	0·39	0·54	0·53	0·57		Kapunda	—	0·61	0·70	1·80
Cradock	1·36	0·68	1·36	0·26		Freeling	—	0·47	0·47	1·45
Wilson	1·54	0·60	2·03	0·26		Stockwell	—	0·50	0·73	1·30
Gordon	0·25	0·61	0·80	0·16		Nuriootpa	—	0·54	0·49	1·68
Quorn	0·20	0·48	0·67	0·2		Angaston	—	0·48	1·08	1·64
Port Augusta..	—	0·47	0·81	0·37		Tanunda	—	0·57	0·58	1·62
Port Germein..	0·21	0·36	0·34	0·89		Lyndoch	—	0·52	0·62	1·33
Port Pirie	0·09	0·35	0·37	0·64		Mallala	—	0·44	0·11	0·87
Crystal Brook ..	—	0·52	1·24	1·02		Roseworthy	—	0·45	2·20	1·06
Pt. Broughton ..	0·16	0·45	0·28	1·10		Gawler	0·03	0·63	0·85	1·07
Bute	0·27	0·33	0·60	0·68		Smithfield	0·02	0·55	0·15	0·68
Hammond	0·21	0·52	1·50	0·29		Two Wells	0·01	0·41	0·03	0·78
Bruce	0·21	0·66	1·09	0·22		Virginia	—	0·45	—	0·65
Wilmington ..	0·14	0·50	0·80	0·61		Salisbury	0·03	0·54	0·54	0·87
Melrose	—	0·83	0·88	0·97		Teatree Gully	0·04	0·78	0·14	1·45
Booleroo C'ntre ..	0·17	0·55	1·23	0·48		Magill	0·09	0·58	0·13	1·43
Wirrabara	0·10	0·59	0·65	1·06		Mitcham	—	0·42	0·05	1·27
Appila	1·57	0·62	2·45	0·74		Crafers	0·11	0·82	0·35	3·07
Laura	0·10	0·61	2·10	1·02		Clarendon	—	0·69	0·07	1·46
Caltowie	0·69	0·63	1·62	0·80		Morphett Vale	—	0·46	0·05	1·00
Jamestown	0·23	0·62	0·58	0·58		Noarlunga	0·03	0·46	0·08	0·59
Gladstone	0·03	0·55	0·78	0·70		Willunga	—	0·60	0·09	0·91
Georgetown	0·28	0·66	0·55	0·78		Aldinga	—	0·33	0·05	0·78
Narridy	0·10	0·59	0·46	0·68		Normanville	—	0·50	—	0·71
Redhill	—	0·60	0·04	0·92		Yankalilla	—	0·31	—	0·98
Koolunga	—	0·71	0·17	0·78		Eudunda	0·53	0·50	2·53	0·91
Carrieton	0·17	0·51	4·50	0·29		Sutherlands	0·42	—	0·97	0·24
Eurelia	0·15	0·48	2·81	0·37		Truro	0·03	0·51	0·36	1·43
Johnsburg	1·15	0·42	2·49	0·34		Palmer	0·03	—	0·34	0·73
Orroroo	1·33	0·55	2·30	0·34		Mount Pleasant	0·02	0·65	0·33	1·08
Black Rock	1·42	1·54	2·66	0·32		Blumberg	0·04	0·57	0·74	1·50
Petersburg	0·38	0·51	1·64	0·56		Gumeracha	0·04	0·68	0·97	1·85
Yongala	0·97	0·56	1·50	0·35		Lobethal	0·01	0·71	0·39	1·61
Terowie	4·25	0·69	5·58	0·32		Woodside	—	0·75	0·44	1·50
Yarcowie	0·52	0·58	4·62	0·49		Hahndorf	—	0·62	0·64	1·78
Hallett	0·16	0·57	1·35	0·64		Nairne	0·02	0·76	0·22	1·66
Mt. Bryan	0·29	0·93	2·04	0·88		Mt. Barker	0·09	0·85	0·92	1·61
Burra	1·00	0·64	2·33	2·08		Echunga	0·02	0·64	0·18	2·50
Snowtown	0·11	0·44	0·11	0·95		Maclesfield	0·07	0·68	0·32	1·89
Brinkworth	—	0·70	0·13	0·77		Meadows	0·05	0·63	0·38	1·71
Blyth	0·08	0·55	0·11	1·43		Strathalbyn	0·03	0·62	0·27	1·26
Claire	0·10	0·77	0·21	1·42		Callington	—	0·51	0·08	0·48
Mintaro C'ntral ..	—	0·69	0·11	1·18		Langhorne's B.	—	0·46	0·22	0·77
Watervale	—	0·64	0·32	1·63		Milang	—	0·52	0·12	0·73
Auburn	0·03	0·78	0·71	1·94		Wallaroo	0·03	0·37	0·13	0·67
Manoora	0·03	0·50	1·26	1·04		Kadina	—	0·34	0·12	0·62
Hoyleton	—	0·45	—	1·13		Moonta	—	0·37	0·12	0·61
Balaklava	—	0·42	0·03	0·83		Green's Plains	—	0·28	—	0·55
Port Wakefield ..	—	0·47	0·26	0·65		Maitland	—	0·43	—	0·78
Saddleworth	0·06	0·68	1·17	1·23		Ardrossan	—	0·35	—	0·54
Marrabel	—	0·48	0·11	1·29		Pt. Victoria	—	0·32	0·01	0·62
Riverton	0·66	0·56	0·93	1·62		Curramulka	—	0·28	0·01	0·55
Tarlee	—	0·51	0·81	1·70		Minlaton	—	0·33	—	0·57
Stockport	—	0·42	0·21	1·01		Stansbury	—	0·32	0·02	0·79

RAINFALL TABLE—*continued.*

Station.	For Feb., 1910.	Av'ge. to end Feb.	To end Feb., 1910.	To end Feb., 1909.	Station.	For Feb., 1910.	Av'ge. to end Feb.	To end Feb., 1910.	To end Feb., 1909.
Warooka	—	0·36	0·08	0·57	Bordertown ..	0·09	0·41	0·16	0·58
Yorketown....	—	0·30	0·12	0·78	Wolseley	—	0·32	0·16	0·82
Edithburgh ..	0·19	0·41	0·79	0·87	Frances	0·12	0·30	0·34	0·90
Fowler's Bay..	—	0·37	0·05	0·48	Naracoorte	0·15	0·59	0·25	1·35
Streaky Bay ..	—	0·47	—	0·52	Lucindale	1·49	0·48	0·49	0·90
Pt. Elliston ..	0·03	0·49	0·08	0·61	Penola	0·30	0·73	1·01	1·39
Pt. Lincoln ..	—	0·50	0·05	1·18	Millicent	0·30	0·77	0·82	1·65
Cowell	0·18	0·46	0·18	0·58	Mt. Gambier	0·36	0·95	1·44	2·41
Queenscliff ..	0·25	0·37	0·25	0·50	Wellington	0·02	0·40	0·02	0·79
Port Elliot....	0·06	0·65	0·17	0·97	Murray Bridge	—	0·40	0·07	0·81
Goolwa	0·04	0·56	0·13	1·06	Mannum	—	0·38	0·33	1·04
Menningie ..	0·1	0·52	0·15	1·17	Morgan	0·33	0·40	0·78	0·64
Kingston	0·07	0·51	0·07	0·91	O'rland Corner	—	0·58	0·55	0·28
Robe	0·17	0·60	0·18	0·94	Remark	—	0·61	0·65	0·54
Beachport	0·27	0·70	0·56	1·06	Lameroo	0·01	—	0·08	1·93
Coonalpyn	0·07	0·39	0·27	1·22					

DAIRY AND FARM PRODUCE MARKETS.

The Manager of the Produce Export Department reports on March 1st—

Eggs.—The month of February was remarkable for long-continued spells of hot weather. The interruption of regular shipping service through the coal strike in Sydney also caused considerable difficulty. These two causes combined to make the inter-State shipments less than usual. At the same time, owing to the seasonable falling off in supplies, the prices hardened considerably. The month opened at 9d. per dozen and closed at 1s. with good demand for circle graded eggs in Adelaide, Melbourne, and Sydney at extra rates. The month was also remarkable for the complaints from the eastern States about the condition of South Australian eggs on arrival. The two causes above mentioned to a large extent accounted for the bad condition of the eggs. Were the egg-producers to sell off or kill all the roosters on the farms the eggs would be infertile and would carry well in any weather, thereby saving thousands of pounds which are now lost through fertile eggs turning bad in hot weather. To a large extent circle eggs are infertile, and this fact accounts for the satisfactory demand for them in the eastern States.

Butter.—The amount of cream coming forward and the manufactures and sales of butter for February have been good, and in spite of the spell of hot weather the quality of the butter has been well maintained. The prices have been steady throughout the month. The market quotations for the day are—Superfine, 1s. 2d.: pure creamery, 1s. 1d.

Messrs. A. W. Sandford & Co. report on March 1st:—

Flour.—City brands, £10; country, £9 1 $\frac{1}{2}$ s., per ton of 2,000lbs.

BEAN.—1s. 0 $\frac{1}{2}$ d.

POLLARD.—1s. 1 $\frac{1}{2}$ d. per bushel of 20lbs.

OATS.—1s. 10d. per bushel of 40lbs.

BARLEY.—Cape, new, 2s. to 2s. 4d. per bushel of 50lbs.

CHAFF.—£3 2s. 6d. to £3 5s., f.o.b., Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £5 5s., Adelaide Station.

ONIONS.—Locals, £4 to £4 1·s.; Gambiers, £5.

BUTTER.—Factory and creamery, fresh in prints, 1s. 1d. to 1s. 2d.; choice separators, dairies, 1s. to 1s. 1d.; weather-affected factory and creamery, 9 $\frac{1}{2}$ d. to 10 $\frac{1}{2}$ d.; off-flavored separators, dairies, 8d. to 9d.; stores and collectors, 7 $\frac{1}{2}$ d. to 9 $\frac{1}{2}$ d., per lb.

CHEESE.—Factory makes, 5 $\frac{1}{2}$ d. to 7d. per lb.

BACON.—Factory-cured sides, 8d. to 9d. per lb.

HAMS.—In calico, 10d. to 11d. per lb.

Eggs.—Loose, 1s. per dozen.

LARD.—Skins, 6d.; tins or bulk cases, 6d. per lb.

HONEY.—Prime clear extracted, 3d.; dark and ill-flavored, 1 $\frac{1}{2}$ d. per lb.; beeswax, 1s.

ALMONDS.—(Scarce) soft shells, Brandis, 7d.; mixed soft shells, 6d.; kernels, 1s. 5d. per lb.

LIVE POULTRY.—Good table roosters realised 2s. 9d. to 3s.; light cockerels, 1s. 9d. to 2s. 3d.; hens, 1s. 3d. to 1s. 8d.; ducks, 1s. 8d. to 1s. 6d.; geese, 2s. 6d. to 3s. 6d.; pigeons, 5d. each; turkeys, from 8 $\frac{1}{2}$ d. to 10d. per lb. live weight, fair to good table sorts.

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Mar.	April.			Mar.	April.
Amyton	*	—	—	Meningie	712	26	23
Angaston	702	26	23	Merghiny	*	—	—
Appila-Yarrowie	*	—	—	Millicent	*	8	12
Arden Vale & Wyacca	*	—	—	Miltalie	*	26	24
Arthurton	*	—	—	Minlaton	†	5	30
Balaklava	*	12	9	Mitchell	*	26	23
Beetaloo Valley	698	—	—	Mounta	*	—	—
Belalie North	*	19	23	Morehard	*	—	—
Bowhill	*	—	—	Morgan	*	26	23
Brinkworth	*	22	19	Morphett Vale	712	15	—
Bute	†	22	19	Mount Bryan	*	—	—
Butler	*	—	—	Mount Bryan East	*	5	2
Caltowie	*	21	18	Mount Gambier	713	—	—
Carrieton	696	24	21	Mount Pleasant	*	11	8
Cherry Gardens	709	22	19	Mount Remarkable	*	24	21
Clare	702	25	22	Mundoora	*	—	—
Clarendon	709	21	18	Nantawarra	*	23	20
Colton	*	26	23	Naracoorte	*	12	9
Coomooro	696	21	26	Narridy	700	—	—
Coonalpyn	*	—	—	Northfield	*	22	19
Cradock	*	—	—	Orroroo	*	—	—
Crystal Brook	699	—	—	Parrakie	*	5	2
Cummins	706	26	23	Paskeville	†	26	23
Davenport	*	—	—	Penola	*	12	9
Dawson	697	—	—	Penong	707	12	9
Dingabledinga	*	11	8	Petina	*	—	—
Dowlingville	*	—	—	Pine Forest	*	22	19
Forest Range	*	24	21	Port Broughton	*	25	22
Forster	*	—	—	Port Elliot	*	19	16
Fowler Bay	*	19	23	Port Germein	700	30	—
Frances	*	—	—	Port Pirie	701	5	2
Freeling	703	—	—	Quorn	†	26	—
Gawler River	*	—	—	Redhill	*	19	16
Georgetown	*	26	23	Renmark	*	—	—
Geranium	*	26	30	Rhine Villa	708	—	—
Golden Grove	710	24	21	Riverton	*	26	23
Goode	*	—	—	Saddleworth	*	18	15
Green Patch	*	21	18	Salisbury	705	1	5
Gumeracha	*	21	18	Shannon	*	—	—
Hartley	*	26	—	Sherlock	*	—	—
Hawker	*	25	22	Smoky Bay	*	—	—
Hookina	697	26	23	Stansbury	*	—	—
Inkerman	*	24	21	Stockport	705	—	—
Johnsbury	*	—	—	Strathalbyn	*	21	18
Kadina	705	24	21	Sutherlands	708	26	23
Kalangadoo	*	12	9	Tatiara	715	—	—
Kanmantoo	†	25	22	Uraidla and Summert'n	713	7	4
Keith	†	—	—	Uteria Plains	707	19	23
Kingscote	710	1	—	Virginia	*	—	—
Kingston	*	26	5	Waikerie	*	—	—
Koolunga	*	23	19	Watervale	*	—	—
Koppio	*	—	—	Wepowie	*	—	—
Kybybolite	*	24	21	Whyte-Yarcowie	†	—	—
Lameroo	*	—	—	Wild Horse Plains	*	—	—
Lipson	707	—	—	Willunga	*	5	2
Longwood	*	26	20	Wilkawatt	*	—	—
Lucindale	713	19	2	Wilmington	†	24	21
Lyndoch	712	24	21	Wirrabara	*	—	—
Maitland	*	5	2	Woodside	*	—	—
Mallala	704	7	4	Yallunda	*	—	—
Mannum	*	26	30	Yongala Vale	*	10	23
Meadows	*	—	—	Yorketown	*	12	9

* No report received.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Carrieton, February 17th.

(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Gleeson (chair), Radford, Fisher, Kaerger, Vater, Cogan, O'Halloran, Bock (Hon. Sec.), and one visitor.

HARVEST REPORTS.—Mr. Gleeson had reaped the best returns from Red Straw wheat, while Steinweidel came next, and Federation third. Experience had proved that it was best to drill in the seed, as the crop was then more even in growth and was less affected by winds. He applied the best phosphates on part of the crop, but the unmanured portion gave as good a return as the manured. Mr. Vater had the best returns from Jonathan; Newman's Early came next, and Federation third. He was of the same opinion as Mr. Gleeson in regard to the use of the drill and the absence of beneficial result from manuring. [Did these two gentlemen reap the plots separately, and weigh and record the results? An extra 40lbs. of wheat to the acre would more than pay the cost of 56lbs. super. We have not met the farmer who can accurately judge the results from experiments of this sort without reaping the plots separately.—Ed.] Mr. Fisher had reaped the best return from Purple Tuscan, sown on green, shallow-ploughed land. Purple Straw was the next best yielder. Marshall's No. 3 he considered too late for this part, as the hot winds were liable to damage it.

Coomooroo, February 14.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Berryman (chair), E. and C. Brice, J. and Jer. Brown, Toholke, Phillis, A. and R. Polden, A. and M. Robertson, and Kildea (Hon. Sec.).

CARE OF IMPLEMENTS.—A short paper on this subject was read by Mr. E. Brice, in which he deprecated the practice of leaving implements exposed to the influences of sun and rain. The cost of the necessary implements to work a farm was no small item. Therefore, they should all be kept under cover when not in use, and he believed it would pay, where stone was available, to build a good shed for the purpose. If stone could not be procured some sort of a shed should be constructed, even if the sides were of bush and the roof of straw. He further thought it would pay to give all implements, such as strippers, harvesters, wagons, etc., a coat of paint every other year, or even each year. This would prevent the wood from cracking and warping. Machines should be overhauled as soon as the year's work was completed, necessary repairs made at once, and all working parts thoroughly cleaned up. A little care bestowed upon machines and machinery saved money and made the work much easier for both men and horses. In the discussion which followed, Mr. C. Brice was of opinion that it was a mistake to thoroughly clean the bearings at the end of the season, because when the oil was cleaned off they were liable to rust. Mr. Berryman thought kerosine would keep the bearings from becoming rusty. Other members considered it advisable to loosen or tighten the nuts according to the season of the year, to allow for expansion and contraction of the timbers. It was also mentioned that grease left on for a year was very difficult to remove from the parts of the machine, and when getting implements out for harvest, frequently there was no time to do it. At the beginning of harvest time blacksmiths were kept very busy, but at this time of the year they would have plenty of time to thoroughly overhaul machinery if given the opportunity. It was generally agreed that when an implement had finished its work for the season it should be at once overhauled and otherwise attended to.

BLUESTONE.—Arrangements were made by this branch to purchase 1ewt. of sulphate of copper for use by the members. At the present time members prefer this pickle to any of those which have not had such exhaustive and universal tests.

CROPPING STUBBLE LAND.—Discussion on this subject took place. Mr. Brown considered that, provided the land was free from weeds and had not been too heavily cropped the previous year, there was no reason why good crops should not be obtained. Mr. Phillis thought new land, or that which had not been cropped for some time, could be sown again with very good results. Mr. A. Robertson had seen three good crops in succession on stubble land. In this

district such a great quantity of land was required to do much fallowing, and this entailed the loss of grass for dairying purposes. It was generally considered that seeding should commence at about the middle of March and extend to the middle of May. Stubble should be skim ploughed in order to bury the seeds.

Dawson, January 22.

(Average annual rainfall, $10\frac{1}{2}$ inches.)

PRESENT.—Messrs. Renton (chair), J., J. A., and F. Wilson, Quinn, Meyers, Burden, Hughes, Kennedy, Smart, and Nottle (Hon. Sec.).

DRY FARMING.—Mr. Meyers reported on experimental work with dry farming methods under his charge. Seven four-acre plots of fallow were prepared and treated as follows:—No. 1 plot, ploughed 6in. deep in July and sub-packed; then harrowed. Harrowed again, twice in September and cross-harrowed in October. The following May harrowed and cross-harrowed and drilled in with 45lbs. of seed and 60lbs. super. The yield from this plot was 14bush. 19lbs. per acre. Nos. 2, 3, 4, and 5 were ploughed to a depth of 5in.; only No. 2 was sub-packed, and in all other respects these four were treated as was plot No. 1, excepting that plot No. 5 was sub-packed immediately before seeding. The yields were—No. 2, 15bush. 4lbs.; No. 3, 14bush. 32lbs.; No. 4, 16bush. 8 $\frac{1}{2}$ lbs.; and No. 5, 11bush. 2lbs. per acre. Plot No. 6 was ploughed to a depth of 4in., harrowed once in September, and the following seeding time drilled in, with the same seed and manure as the foregoing plots. The yield was 12bush. 54lbs. per acre. Plot No. 7 was ploughed 4in. deep, harrowed and cross-harrowed on May 8th, and drilled in as the others. The yield of this plot was 13bush. 47lbs. per acre. The rainfall from seed time to harvest was 8in. 10 points, and for the calendar years 1908 and 1909 9.95in. and 10.36in. respectively. The plots Nos. 5 and 6 were badly damaged by grasshoppers, and consequently the figures are of less value concerning those particular items. It should also be noted that plot 4 ploughed up very roughly owing to the surface soil being baked hard. [This plot No. 4 returned the highest yield of all.—Ed.] The value of this class of experimental work to the local farmers was spoken of in the highest terms.

Hookina, January 22.

PRESENT.—Messrs. M. Woods (chair), A., J., W. P., and J. Henschke, jun., L. Woods, Murphy, F. and S. Stone, Kelly, Madigan (Hon. Sec.), and four visitors.

FLAG SMUT.—Mr. J. Henschke read a paper on the question of flag smut (sometimes miscalled black rust). This disease had cost him half his crop this year, the wheat grown on fallow and stubble land being equally affected. It did not seem to make any difference whether sown in dry soil or after a good rain. In some cases it attacked only one or two stems of a plant, and in others it destroyed the whole plant. He wished to learn the opinion of others on the matter. A good discussion of the subject ensued. Members agreed that wet and dry sowing made no difference in regard to this trouble. It had been noticed on rare occasions that flag smut and bunt attacked the same plant. King's Early, Purple Straw, and Fill-the-Bag wheats seemed to suffer most from flag smut in this district, while Bluey appeared to be free from it. [This flag smut is a fungus disease which chiefly attacks the flag, but it may also occur on the sheath and stem, and even on the chaff, destroying the grain. Plants affected rarely come to ear, and if they do and grain is formed it is extremely small and shrivelled. Professor McAlpine recommends pickling seed with formalin at the rate of 1lb. to 40galls. of water, steeping the seed in it for 10 minutes and then allowing it to dry before sowing. He points out that as formalin has proved to be effective for the prevention of stinking smut or bunt of wheat the fact of it also acting as a preventive of flag smut is an additional reason for using it in preference to the bluestone pickle wherever flag smut is to be feared. The objection to formalin is that unless the wheat germinates fairly soon after pickling and sowing the grain at times appears to be injured.—Ed.]

STALLIONS AND VETERINARIES.—Members were of opinion that travelling stallions ought to be thoroughly sound, and considered the action taken to bring this about to be a step in the right direction. They also thought qualified veterinary surgeons should be placed in good centres as an additional safeguard against the spread of stock complaints.

JOHNSON GRASS.—The Hon. Secretary tabled a sample of this grass grown without irrigation. It was much admired by members.

Hookina, February 19.

PRESENT.—Messrs. Gloede (chair), Kelly, F. and S. Stone, Henseke (jun. and sen.), Woods O'Connor, and Madigan (Hon. Sec.) and two visitors.

SEEDING.—A discussion on this subject was introduced by a short paper from Mr. Henschke, who said that one of the most important factors was to have the land in good order before sowing. He thought stubble land should be sown after rain, as then it would be free from weeds. Seed should always be pickled to avoid smut [bunt.—Ed.]. He would procure new seed wheat in preference to old, as it usually germinated better. It was advisable in this district to drill in fairly deeply, as otherwise the birds took a great deal of the seed, and germination seemed to be better at a fair depth. Mr. Gloede thought it unadvisable to supply super. to stubble land. While good results were obtained from manuring fallow land, in this dry district the crops grown with super. in stubble land seemed liable to blight off. Other members could not agree with this, but were strongly of opinion that the application of superphosphate in suitable quantities improved the crop on stubble as well as fallow ground. The general impression seemed to be that 3in. was about the best depth to plough, and that going deeper than this did more harm than good. The wheats chiefly grown here were King's Early, Bluey, Steinwedel, Allora, Marshall's No. 3, Fill-the-Bag, and Purple Straw.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, January 24.

PRESENT.—Messrs. Fradd (chair), Woolford, Bird, Petrie, Burton, Jacobi, J. J. and J. A. Ryan, A. and F. Bartrum, Curtan, and J. Murphy (Hon. Sec.)

FARMING IN THIS DISTRICT.—Mr. Curtan read a short paper on this subject. He considered that if properly conducted farming here was a payable occupation. Early fallow well-worked through the summer was best. Sowing in stubble land in this district gave very poor returns. It was a difficult matter to work summer fallow to a fine tilth. He would sow a little over a bushel of seed with 80lbs. super. per acre. Marshall's and Federation were among the best wheats for the district. He was in favor of harrowing after drilling, and would roll where the crop was for hay. Harvesting should be completed as speedily as possible. He would use the complete harvester, even though the ground might be a little uneven. Wheat should be carted as soon as reaped, as it lost weight if left standing in the sun. Wheat-growing conducted in this manner ought to return 27bush. to 30bush. per acre in this district in a fair season. In the discussion that followed members were divided in opinion as to the advisability of working fallow in the summer. All agreed that when ploughing for fallow the ground should be turned to a depth of at least 4in. [If it is desired to retain the moisture in the soil the surface should be worked from time to time, after every rain, to prevent it from becoming caked; otherwise evaporation will take place very rapidly.—Ed.]

CARE OF FARM HORSES.—Mr. F. Bartrum read a paper on this subject. The high value of good horses should be sufficient inducement to farmers, he said, to take greater care of them. If possible, stables should protect the animals from the north and west winds. Thorough ventilation without draughts should be arranged. He preferred stone and iron stables to those of straw on account of the durability of the former and the harbor for birds and vermin provided by the latter in addition to the risk of fire. Regular feeding would produce the best results, and every horse should get his share. To ensure this it was best to have a separate stall for each animal, and that provision would greatly lessen the danger of accident and kicking. Long hay should be fed to horses as well as chaff, and the best time for it was when the day's work was over. A plentiful supply of fresh clean water was essential, and horses should be watered before feeding. Rock salt should always be in the mangers. Collars should fit well and be kept soft by tapping with a bottle; otherwise sore shoulders would result. Members were divided in opinion as to the respective merits of straw and stone and iron stables. The supporters of the

former were slightly in the majority on account of their coolness in summer and comparative warmth in winter. One member thought that, with the natural shelter of this district, stables were unnecessary, and that horses left out were hardier and healthier than those kept in hot stables. Another farmer recommended the use of the rack for feeding long hay. He considered that horses did better and did not waste any hay when fed in this way.

Crystal Brook, January 22.

(Average annual rainfall 15in.)

PRESENT.—Messrs. Kelly (chair), Pavy, Forder, Shaw, Burton, Tozer, Carmichael, Davidson, Hutchison, Forgan, Lovelock, Reynolds, Billinghamurst, Wood, Miell, B. Weston, Venning, Jasper, Cooke, Townsend, and M. Weston (Hon. Sec.).

TREE-PLANTING.—The following paper dealing with this subject was read by Mr. Shaw :—
“ This subject has had considerable attention for many years, but the time has now arrived when it will have to be dealt with more seriously, as the timber supplies of the world are getting lower every year. The forests of the U.S. of America are within measurable distance of being depleted of timber suitable for economic purposes—such as joinery and paper-making. They are awakening to this fact when it is almost too late. Scientific men may discover a substitute for wood for paper-making, but I hardly think a substitute will be found for timber suitable for joinery purposes. Nature still has to supply this need, and it takes many years from planting to maturity. Germany has gone in very extensively for replanting of timber suitable for commercial and industrial purposes. Australia's efforts in this direction have been practically *nil*. Replanting in comparison with deforestation has been woefully inadequate, but South Australia has been more progressive than any of the other States. The bonus offered by the S.A. Government some years ago was a stimulus to tree-planting by private individuals. This was probably a step in the right direction, as it resulted in thousands of useful trees being planted. The magnificent pines on the Hill River Estate were planted on the bonus system, and are to-day a sight worth going a long way to see. Another serious aspect of this question is that deforestation has a detrimental influence on climate and rainfall. There are tracts of country in the south of Europe which, before being denuded of forests, had a good rainfall and climate. Forests were indiscriminately cut down and the result is that to-day the country is comparatively desolate, the rainfall is intermittent, droughts succeed deluges, bleak and cold in winter scorching hot in summer, and the soil cut away by gaping chasms caused by flood waters. I think we are making a great mistake in allowing the grand old gums that line the banks of some of our northern creeks to be ruthlessly felled for sleepers. Some when cut down are found to be unsuitable for sawing up, and are left to rot on the ground with their giant limbs stretched out, as it were, in protest against vandalism and cupidity. Reserves set apart for forest planting are looked upon with jealous eyes, too frequently ending with the reserves being leased for other purposes and planting abandoned. I think a lot more could be done in this State in the matter of tree-planting. The observance of an arbor day is decidedly a good thing, teaching the rising generation how to plant trees and the value of so doing, but why not an arbor day for adults? Why not form societies or associations over the length and breadth of the land pledged to assist and forward the objects of tree-planting by every legitimate means? This would assist the Forest Department, and societies formed in each district could gain information and give it to anyone as to the best kind of tree and the way to plant. I think each Bureau in the State could form a committee from its members to carry out this object. If every member of each Branch only planted a few trees each year where practicable it would soon alter the aspect of the country. Young trees may be had from the Government nurseries for the asking. No one can complain of cost, but it is not sufficient to get a few trees from the nursery and just make a hole in the ground sufficiently large to take the piece of bamboo containing the young tree, and then leave it to the tender mercies of vermin and trampling stock. The trees need a little care for a year or two and after that they will take care of themselves. The question arises as to whether it should not be made compulsory to plant trees. What looks more dreary than a farmhouse built on an open plain without a tree or shrub near it? In such cases as this I think it would not be going too far to compel owners to plant. There are a number of farmers who take great pains to grow trees around their homestead and also as shelter belts for their stock. We all know the value of the latter, and we also know that farm lands that have been improved in this respect bring a better price when put on the market. The cost of labor of beautifying a place by tree-planting is not great, and I consider that it is a debt we owe to posterity. We talk very freely of a great and

glorious future Australia, but in my opinion it will not be very great and glorious if comparatively treeless. Would it not be advisable for the Government to insert a clause in every lease of scrub land that a fringe of scrub be left standing around every block? Also that belts of scrub be left standing; the quantity to be governed by the area of the block. This would to a great extent prevent sand from drifting, give shelters to stock, equalise the temperature, and add to the picturesqueness of the country. This is a great national question, and must be grappled with if we are to hold our own in competition with other parts of the world. A large proportion of our exports are packed in cases made with imported timber, and some of the most valuable of our hardwood forests are now being cleared at a rapid rate to supply blocks for paving and railway sleepers, &c. A noted timber expert in England stated some time ago that the day is coming when this timber will be worth 2s. 6d. per foot instead of, as at present, about 3d. A few days ago it was stated in the press that in California they are planting the Australian hardwood trees as a business proposition because the hardwood trees of America will soon be too scarce to meet the demands. Apart from beautifying the homestead, I think it the duty of every patriotic Australian to assist forward by every means in his power a big national scheme for tree-planting, which would eventually provide timber for all economic purposes and add to the future good and prosperity of this great country."

Narridy, January 26.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Huren (chair), Satchell, Darley, Nicholson, Nicholls, Lehmann, Hodges, Liddle, E. and P. Smart, Kelly (Hon. Sec.), and 20 visitors.

ESSENTIAL FACTORS IN SUCCESSFUL WHEAT CULTIVATION.—An address on this subject was given by Mr. A. E. V. Richardson, B.A., B.Sc. An explanation as to what constituted soil fertility was first given. Phosphoric acid, he said, was the constituent generally deficient in South Australian soils. Superphosphate was the most profitable manure to supply this want. At present neither potassic nor nitrogenous manures were likely to be of much value in cereal-growing. Generally speaking it was good business to buy the manure in which the unit of phosphoric acid was cheapest. Thus a super. containing 40 per cent. of water-soluble phosphate at £4 10s. per ton was cheaper than a lower grade of, say, 30 per cent. at £3 10s. per ton. In the former the price per unit was 2s. 3d. as against 2s. 4d. in the latter. The quantity of super. to apply depended upon the rainfall: at Narridy 50lbs. or 60lbs. per acre was a fair application. Thorough working of the soil was a second essential to success. This meant deep and frequent working. Departmental experiments had given excellent returns for deep working. The use of good seed wheat of the right variety was also of great importance. The difference in the yield of two varieties on the same farm, treated exactly alike was sometimes enough to more than pay interest and rent of land. At Parafield Federation returned 36bush. per acre, while Marshall's grown alongside yielded 21bush. The difference, 15bush., was worth £3 per acre. Some farmers sold their best wheat and kept the inferior grain for seed. This was a mistake, and it was becoming realised gradually that it paid to exercise the greatest care in the selection of seed wheat. At this stage the speaker dealt with diseases of wheat, and where possible indicated the best preventive measures. He also spoke of experimental work, and expressed the wish to arrange for some to be conducted in this locality. In speaking of varieties of wheat Mr. Richardson recommended a trial of Bunyip and Cumberland in this district, and also some long hay wheats, such as Medeah and Huguenot. A good discussion followed, and a number of questions were put to and answered by the speaker.

Port Germein, January 29.

Average annual rainfall, 12in.)

PRESENT.—Messrs. Carmichael (chair), Hillam, Head, Holman, Deer, Crittenden, and Blessing (Hon. Sec.).

LESSONS FROM HARVEST.—At the previous meeting members discussed the harvest results. In some cases crops grown without fertilisers yielded better than some manured crops, while elsewhere the position was quite the reverse. Fertilisers are not extensively used here. It was noticeable, however, that fallow land gave far better results than did the stubble paddocks, and this has not always been the case in this district.

SOIL EXHAUSTION.—The Chairman spoke of the comparative sterility of some of the soils in this district. There appeared to be very little difference in the soils, and yet the application of superphosphate did not improve the yields. It was resolved to submit samples of some of these soils for analysis, to ascertain what fertilisers would be most suitable. [Unfortunately, analysis of soils will not show definitely what manures to use, and the only satisfactory way to find out is to experiment with various manures, applying different quantities to the several plots. To be of any value the results from each plot must be carefully weighed and recorded.—Ed.]

Port Pirie, February 5.

(Average annual rainfall, 12½ in.)

PRESENT.—Messrs. Johns (chair), Munday, Bell, Smith, McEwen, Welch, Grey, and Birks (Acting Hon. Sec.).

TAKEALL.—The Chairman read the following paper on this subject: “Does takeall live in the soil from one year to another? If so, what are the best means of treatment?” :—“We frequently hear of the loss occasioned by the death of cattle from dry blight, and every now and then we hear of horses dying from various causes, but I think they are a mere trifle compared with the loss caused by takeall. The only difference is that one is a direct loss and the other an indirect loss. Takeall was in existence as long ago as I can remember, and it seems we are no nearer a solution of the mystery than we were 50 years ago. That it is a fungus which attacks the lower stem of the plant we know, but that is as far as we have got. Does the fungus live in the soil from one year to another? Undoubtedly yes. The question is how to check its ravages. One man's experience is that takeall is worse in well-worked fallow, another that it only affects stubble land; another avers that seed from an affected area caused takeall in a clean paddock. There is no doubt its ravages are less on sandy rises or heavy clay land. It is the loose or dusty class of land that is more frequently affected. The land in our district, as a rule, varies considerably in its nature even in the same paddock; hence the difficulty of treatment. You will notice in an affected area there are always some patches not affected. Why do some plants escape? I noticed last harvest takeall affected patches, with here and there a few plants quite healthy, so that it is evident we are not going to destroy absolutely the fungus by treatment of the land, though in my opinion it can be checked to some extent by judicious treatment. Avoid, if possible, working the land when dry, but the more working the better when in a moist condition. Unfortunately, in this country, we cannot always get the moist condition when wanted. I notice at the present time a quantity of fallow is covered by a crop of potato weed and wild melons, and if we do not happen to have rain before seeding time the land will all have to be worked to get rid of that pest. Some advocate rotation of crops, others only crop once in three years. No doubt both are preventives. In my opinion there is only one cure, and that for only a time, and that is to burn enough stuff on the land to make it quite hot; but that method, of course, is not practicable on a large area. The practicable method is early fallow, crop once in three years, frequent stirring when moist—in fact, carry out the principles of dry farming.” In the discussion which followed Mr. C. Birks said that in his experience there was less takeall where sheep had grazed previous to cropping. He had always adopted the practice of getting as many sheep as possible on the paddocks before cropping. Mr. Munday found that the flats suffered much more than the sand rises, but he could not say what was the cause. He used to think the cause was due to fungus, but he now doubted this. Whenever they had takeall they would find many thousands of little bugs, and he thought it was a moot point as to whether the trouble was not due to these. He had cropped every third year for the last 15 years, and thought it was the proper course to adopt; but it did not do away with the takeall altogether. He had seen the grass affected where there had not been a wheat crop for four years. He thought it was desirable to work the land wet, but the trouble was to get the land wet in some seasons. He had suffered losses from takeall during the wet seasons as well as the dry, and had lost nearly as much as through red rust. Mr. Bell had had trouble on his stubble paddocks recently. His attention was drawn to the tracks over which bullock teams used to travel, and he found takeall did not exist there. He thought the trouble did not occur on hard grounds, but on the lighter soils. He had found it occur on patches where the fire had not spread. He believed in as heavy a stubble fire as possible and followed this with an early fallow. He thought that it was not possible to have too firm a bed for wheat, and if soil could be packed well underneath, as a firm bed for wheat, it would go a long way towards preventing takeall.

Growing oats had been recommended, but whether this would eradicate the trouble or not he could not say. Mr. Birks had seen a paddock half of which had large patches of takeall and the other half was absolutely free. Wheat had been grown in the paddock; then the second year half of it was fallow and the other half in oats. The third year wheat was put in again, and takeall was entirely absent in the portion of the paddock which had been under oats. That was the most striking example of the value of oats. Mr. Greig said that he ploughed a paddock which had been under grass three years, and the return was 7bush. to the acre. The hard ground had takeall in patches. He did not agree with Mr. Johns's suggestion as to takeall being a fungus, as if it occurred from year to year why did a crop of oats kill it? Was it that there was something in the oats poisonous to the takeall? He thought they had a very difficult task, and that it was a case for the scientist to decide. [In order to live a fungus must have a host plant to live on. Takeall cannot live on oats, and therefore if this cereal is grown instead of wheat for sufficient time the fungus dies of starvation.—ED.] Mr. Welch said his experience was that they had takeall mostly on limestone ground. He did not think that cropping every year made any difference. He found it chiefly on limestone ground, and did not think seed from affected areas had anything to do with it. He had never suffered on plains ground, except from want of rain. Mr. Smith said a farmer at Mr. Kennelly's farm had ploughed in his stubble and drilled in with a disc drill, and the whole of the paddock of 500 to 700 acres was a splendid crop and not a sign of takeall. In this case the soil was a sandy loam. He agreed with Mr. Bell in regard to the firm land, as in the old days they could only get wheat on the bullock and team tracks where it was impossible to plough more than about 2in. Mr. Johns, in reply, said he was pleased with the discussion. There was no doubt that sand rises were not favorable to takeall, but as soon as you got on to limestone the takeall appeared. He had noticed many times that where tracks occurred on the clay soils they got the best crops, but on the tracks over sand rises the same results could not be obtained. The burning of stubble was not enough; but if fire enough could be obtained to heat the ground the fungus would be destroyed. He had inspected sand rises where the stubble had been ploughed in, and found there was no takeall; but as soon as the harder ground was reached takeall inevitably appeared.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, January 29.

(Average annual rainfall, 21½in.)

PRESENT.—Messrs. Stephens (chair), Wishart, Player, Waters, Swann, Roberts, Friend, Sibley, Ball, Smith, Salter, Thorne, Matthews (Hon. Sec.), and three visitors.

MARKET QUOTATIONS.—Members of this branch consider that they are at a great disadvantage because no market quotations for currants and certain other products are published in the daily press. They, therefore, have to accept prices for produce without knowing what the ruling figure is. They would like to see this state of affairs altered.

Clare, January 21.

(Average annual rainfall, 24in.)

PRESENT.—Messrs. McCarthy (chair), Forbes, Bowman, McKenzie, Miller, Jarman, Irvine, Berridge, W. and E. H. Kelly, Pryor, Keane, I. C. and C. J. Radford, Pascoe, Maynard, Nolan, Lee, J. H. and P. H. Knappstein (Hon. Sec.), and one visitor.

CURRENTS.—Mr. McCarthy asked why it was that the berries on currant vines with dense foliage did not ripen nearly as well as on vines with less foliage, and wished to know whether topping the useless shoots would have any beneficial effect. Members gave instances of topping in which the yields had invariably been improved.

NOXIOUS WEEDS.—A paper on this subject was read by Mr. Bowman. "The speed with which such a tremendous variety of weeds had spread over the cultivated areas of this State was a matter for amazement and concern, and there was no denying that to keep them under control meant hard work. Most of our noxious weeds are annuals, and can be destroyed by cutting them below the surface of the ground before they seed. There are some bulbs which increase to some extent under ground, but I think even they spread mostly from seed, and can be kept under control by not allowing the seed to mature. I believe the very worst of weeds can be kept down, perhaps exterminated, if attacked when they first appear—just a single plant here and there. The trouble is that some weeds have been allowed to spread to such an extent that it is next to impossible to deal with them now. It looks like indifference on the part of our early settlers, but they probably never realised the mischief that would come from these plants, or they would have treated each one in the same way that we all treat a snake when we have the chance. In my opinion the worst weed we have in these parts is the yellow star thistle (*Kentrophilum lanatum*). I have had a lot of experience with it, and know how difficult it is to even keep within bounds. It has a cast-iron constitution, and no soil or situation comes amiss to it. I have seen plants growing from a crevice in rock, where it was impossible to cut it up below the surface with a hoe or even a pocket-knife, and the only way was to pull it out by hand. A few plants might be treated in this way, but to pull it by hand on anything like a large scale would not be possible. Where it has appeared in any quantity it has come to stay, and those who are fortunate enough to have escaped it so far should use their best endeavor to keep it off their land. The same remarks apply to the Cape tulip, which is one of the worst to deal with. I have been fairly successful on small patches with salt, scraping the ground bare with a spade and then applying coarse salt thickly. This has killed the tulip and everything else for the time being, but I think in a few years' time the ground will come back to grass. This plan would, of course, be impracticable on a large scale. A good rule to follow if you see a plant growing where there are stock, and it is never eaten, no matter how nice or harmless it looks, is to cut it up. Those are the sort that spread and take the place of grasses. There are many of these about. For example, there are two other kinds of star thistle—the stemless horse thistle, which grows flat on the ground, is a fearful nuisance when established; the other is a small plant growing close to the ground, and bearing a reddish flower, which is appearing in the spring of the year on our grass land. Another plant with a bluish flower on a long stem, somewhat similar to the leek, I am told is the garden salsify, and a good fodder plant. Of this, however, I am doubtful, and advise the destruction of it where possible. We have not much of the mustard weed in this district. It is a great nuisance in some parts, and should be checked here if possible; but the plant we ought to watch most carefully is one that has a blue or purple flower, and grows somewhat after the fashion of a sage bush. There are acres of it around Gladstone, and when in flower some fields of it can be seen for miles away. We have it here—not much of it yet—but there soon will be if it is not checked. This is not on the gazetted list of noxious weeds. The question is how to check it? We have our laws, of course, but they do not seem to have much effect. The district councils send out notices every year. These notices have a long list of noxious weeds, and state that within 21 days the landowner having any of the weeds mentioned growing on his land must effectually destroy them all. We all know that in many instances that is impossible, and so there the matter ends. I think that in some respects the Act might be altered with advantage. The subject of my paper is one which I think Agricultural Bureaus might well take an interest in. I believe the objective of the Bureaus is principally educational, and I would prefer to see them follow that line of action in dealing with noxious weeds rather than use any coercive measures, which may well be left to the responsible parties. If members of the Bureau would make themselves acquainted with the various weeds we have to guard against, and warn friends and neighbors of the danger of letting them spread, I think much good would result. Members might even go so far as to cut up any strange-looking plant they might see growing on the roadside in passing, for who knows but what in some innocent-looking plant there may not lurk a danger similar to the prickly pear of Queensland." The paper was well discussed.

Freeling, February 11.

(Average annual rainfall, 17½ in.)

PRESENT.—MESSRS. A. Mattiske (chair), Heinrich, Neldner, Shanahan, Wehr, H. and R. Mattiske, Peters, Bayley, G. T. and A. Elix, Keane, Koch, Neindorf, Steinfeldt, Block (Hon. Sec.), and six visitors.

hundred of Wallaroo was disappointing. At Tickera, Yellow King wheat, sown with 75lbs. super., yielded 16bush. per acre, and at the same place, with a similar quantity of manure, Marshall's Hybrid returned 18bush. and Marshall's No. 3 16bush. per acre. The Chairman had not cross-drilled, but said Mr. Reid had done so, and reaped 32bush. per acre. If the extra 10bush. was due to the cross-drilling it would pay handsomely to do it. Mr. R. Correll also showed samples of wheats grown by himself. His harvest averaged 16bush. per acre. Takeall had been responsible for considerable loss. He had applied 70lbs. to 80lbs. manure to the acre and thought, perhaps, this was too heavy a dressing. He considered that but for the takeall his return would have averaged 30bush. per acre. Yandilla King was a prolific yielder. The heads were well filled and it stooled out well. It was also an easy wheat to thresh, and he recommended all farmers to grow a little of it. Marshall's Hybrid ripened six to ten days earlier than most other wheats; but he did not think it was altogether suitable for the limestone soils, as it was liable to blight. The Chairman spoke of the broken grain in seed wheat. This was probably caused by the harvesters, and it would pay to go over the seed. It was only by carefully selecting the best grains that the quality of the wheat was maintained. If they did not grade their seed wheat they would go back. The attention given the wheats and the manuring by scientific men had direct bearing on the success of the farmer of to-day. Mr. Pedler grew Viking last year, but he was strongly of opinion that it was very liable to rust. He had the best results from Federation. It was not rust-resisting, and should be sown on favorable land. Sown on dirty land it did not produce the same result that it did on clean land. Yandilla King was the best wheat he had this year. It returned about 20bush. to the acre. Manitoba turned out poorly, only yielding 9bush. to the acre. Some of it was blighted off by the hot weather just as it was coming out into head, and he did not think it was suitable to the district. Mr. Roach supposed every farmer had noticed that the stony land was a failure this season. He thought this was on account of there being so much rain right through the winter and the roots of the plant being attracted to the surface, so that when the hot weather came there was not sufficient moisture to supply the needs of the plant. In the drier years the stones shielded the young plant somewhat and the roots went down and so had enough moisture during the hot weather. In the drier years he generally reaped more wheat from the stony patches than from other parts. Mr. Correll said the rain came almost before it was wanted. There was such a rank growth, and the land seemed to have too much moisture for its nature. Then when the hot weather came there was not enough moisture left to mature the grain.

WESTERN DISTRICT.

Cummins, January 22.

PRESENT.—Messrs. Cooper (chair), Hamilton, Potter, Nosworthy, Hall, Hill, and Sivior (Hon. Sec.).

BEST WHEAT FOR HAY.—Mr. Hamilton read a paper on this subject. He considered that of all the good hay wheats now grown Dart's Imperial and Marshall's No. 3 were at the top of the list. Complaints were made that the hay now grown was not equal in quality to that of the past. He did not attribute the cause of this to the use of super., but thought it was in the wheats grown. Where hay was grown for sale there was a tendency to plant varieties noted for length of straw and weight rather than to grow those wheats known to have strength and sweetness. Crops were sometimes grown yielding 4 tons to 5 tons of hay to the acre and standing 5ft. to 6ft. high. The paper continued—“Of the local wheats I favor Pioneer Purple Straw. This is very similar to the old Purple Straw, but grows much higher, has a lot of flag, and makes nice clean chaff. I cut some of this variety grown on fallow, and consider it went fully 3cwt. or 4cwt. more per acre than Steinwedel or Yandilla King that was growing beside it on similar ground and treated in exactly the same way. Yandilla King also has a lot of flag, does not dry off at the bottom, and has a splendid color. For early feed or hay King's Early is hard to beat. It grows fast, matures quickly, and stock prefer it to most wheats. It is not nice work chaffing it on account of the beard, and that is the only feature against it.” The advantage of growing good tall wheats, such as Huguenot

and Indian Runner, in districts where the ground was uneven was mentioned, provided that quality went with length of straw. He considered it wise to grow for hay a variety of wheat which was also a good grain-yielder. If it was then necessary to cut portion of the wheat crop on account of hot winds, &c., that amount of crop for grain could be made up from the hay paddock. Now that a good deal of local land had been cropped three or four times, takeall might be expected, and he therefore recommended growing more oats for hay. Oats were immune from takeall, and growing them improved the soil for a succeeding wheat crop. In the discussion which followed most members considered that local farmers should grow oats. Mr. Nosworthy liked oaten hay. The Hon. Secretary preferred wheaten hay and fed plenty of crushed oats with it.

Lipson, February 19.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Provis (chair), Christie, Barraud, Carr, Bratten, G. A. and A. B. Wishart, Dowell, McBride, Potter (Hon. Sec.), and one visitor.

WHEAT FOR DISTRICT.—A general discussion on the best wheats for the district took place. Federation was thought very highly of by all. Indian Runner had been tried by Mr. Barraud, but the result was so poor that he would not attempt to grow it again. Yandilla King was not quite so popular as it once was, on account of the tough straw. Ranji was considered to be a good hay wheat, growing tall and fine; its chief drawback was that it was liable to go down. King's Early was losing favour on account of the hardness of the straw and difficulty of tying with the binder; the one strong point in its favour was its yield. Silver King was considered the best wheat for hay known in this district. Huguenot had not been grown by those present, but on account of its giant growth and the many things said in its favour, members would very much like to have a closer acquaintance with it.

LOSS OF WEIGHT OF WHEAT.—Mention was made of the surprising loss of weight which occurred by leaving wheat in the paddock for some little time. As much as 17lbs. per bag had been recorded by some members as the difference in weight between wheat weighed immediately it was reaped and that which was left standing in the paddock.

HEDGES.—Mr. Dowell wished to know the best kind of hedge to grow. Members recommended the African box thorn for this district on account of its hardness.

Penong, February 12.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Bennier (chair), Shipard, Lovell, Kalmar, Wold, Kreig, King, Oats (Hon. Sec.), and one visitor.

RABBITS.—In discussing the question of the rabbit pest the Chairman advised members to procure narrow strips of netting about a foot wide to place along the fences where the old netting was rusting through. This would make the fence good again, while to attempt to lower the netting which was originally put along the fence would result in the rabbits being able to get over it. Mr. Shipard and the Hon. Secretary thought this would be a good plan, as it would be less expensive than replacing the netting to the full width, and would enable farmers to put in a stronger and better quality.

EXHIBITS.—Mr. Shipard tabled a sample of Kubanka wheat which he had grown as an experiment. Members were of opinion that it was not suitable for this district. Pigs, grown by the same gentleman, were also shown, and it was considered that these should be successfully grown here provided a little care was bestowed upon the young trees until they were well established.

Utera Plains, February 19.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), R. H. and T. Hornhardt, West, J. and M. Abrook, Hill, Guider, Menning, Stephens, Ramsey (Hon. Sec.), and one visitor.

FARM MANAGEMENT.—Mr. Hill read a paper on this subject. At the outset he said the greatest care should be taken in breeding and feeding stock. Horses should be fed frequently, receiving a small amount each time rather than being given a large feed at longer intervals. If this method were followed he considered they would do better and waste much less food. It always paid, he said, to treat horses well, and they should only be made to do a fair day's work. He thought that plenty of good feed was much more effective than the use of the whip.

to get the best work out of the animals. The danger of overstocking holdings was touched upon, and the foolishness of keeping any animals short of food. Having given proper attention to the stock, due regard should be paid to the property itself, keeping the fences in good order, and generally improving the appearance of the homestead. A blacksmith's forge would be found very useful on any farm, and, having acquired a little practical knowledge in the use of it, the owner would be saved many a trip to the blacksmith. The use of fertilisers should not be stinted, but the most suitable quantity for the soil and district should invariably be applied, and the farmer should remember when paying his account for fertilisers that he is only repaying to the soil something that has been taken from it. Repairs to implements and machinery should not be delayed a day longer than necessary. If temporary repairs had to be effected the job should be properly attended to before starting work next morning. The wooden parts of implements and machinery should be painted occasionally. If there was fear of dry rot in fencing posts the application of a solution of 100lbs. of chloride of zinc and 100lbs. of salt in 35galls. of water would be found an effective preventive. Harness should be kept well oiled and hung up on suitable pegs when not in use. All machinery and implements should be kept under cover, as the influences of the weather when exposed would speedily damage or destroy a great deal of expensive farm plant. Farmers who used harvesters would find it advisable to gather a portion of the straw each year, as this would be beneficial to the stock in the winter, and might come in handy in many other ways. Where the stripper was used at least a portion of the cocky chaff should be preserved for similar purposes. The day was speedily coming when every good farmer would prepare his seed for the soil as carefully as he now prepared his soil for the seed. In his opinion seed wheat should all be graded, and it was absolutely necessary to pickle it. A good strain of poultry might be profitably kept in conjunction with the farm, provided they were properly cared for. A further duty of the South Australian farmer was to introduce his sons to the Bureau meetings, and give them the opportunity to learn all they possibly could of the best methods of winning a livelihood from the soil. The probable result would be an increased interest in farming and the production of enthusiastic members of the Agricultural Bureau.

SUFFOLK PUNCH.—Members wished to know whether the Suffolk Punch was a distinct breed of horse, or produced by cross-breeding. [The Suffolk Punch is quite a distinct breed of horse.—ED.]

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Rhine Villa, January 28.

(Average annual rainfall, 10 $\frac{1}{2}$ in.)

PRESENT.—Messrs. G. A. Payne (chair), Hayden, Mickan, Hecker, and Vigar (Hon. Sec.). **WHEAT VARIETY TESTS.**—The Hon. Secretary reported on the experiments in wheat-growing which he had conducted for the department. The following varieties, all sown at the rate of 60lbs. of seed with 1ewt. manure, yielded per acre as under:—Yandilla King, 25bush. 29lbs. ; Dart's Imperial, 23bush. 55lbs. ; Carmichael's Eclipse, 21bush. 48lbs. ; Silver King, 21bush. 33lbs. ; King's Early, 19bush. 55lbs. : Pratt's Comeback, 18bush. 53lbs. ; Marshall's No. 3, 16bush. 58lbs. Silver King, sown 45lbs. seed per acre and 40lbs. manure, yielded 17bush. 25lbs. [It will be seen that the Silver King when sown at the heavier rate of seed and manure, costing, say, 3s. 10d. per acre more than that for No. 2 plot same variety, returned 16s. extra per acre.—ED.] The rainfall from seed time to harvest was 8in. 52 points, while for the year it was 12in. 11 points. All the plots were sown by June 7th and harvested by January 7th.

Sutherlands, January 26.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Snell (chair), Mibus, Dohnt, Doecke, Byrnes, Twartz (Hon. Sec.), and one visitor.

KNOWING THE SOIL.—The Hon. Secretary read a short paper, in which he emphasized the need of a thorough knowledge of the soil, its qualities and deficiencies. Some land,

he said, might be so rich that very little need be known of it to enable the owner to obtain good results from it; but this was not the case with most of the soils in South Australia. Although agriculture was such an ancient industry, probably less was known by the average farmer concerning his soil than anything else pertaining to the farm. This had been excusable in the past, but to-day every farmer could learn something of the nature and needs of every class of soil on his property by observation and experiment, and this would have a direct bearing on the return won from the land.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, January 25.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Ricks (chair), A. and T. Jacobs, Kayser, Lewis, Curnow (Hon. Sec.), and one visitor.

APPLE VINEGAR.—Mr. A. Jacobs read a paper describing the way to make vinegar from apples. Bruised or over-ripe apples could be utilised for this purpose as well as those in better condition. The apples should be pulped and covered with water in a cask and left to ferment. This should be stirred at least once a day to keep it in an even state of consistency throughout. When well fermented the liquid was strained off through a cloth, and brown sugar added at the rate of 12lbs. to each 6galls. or 7galls. This would set up a second fermentation and give the vinegar a nice color. During this ferment it should be left open to the air, and shortly after it had finished working it could be bottled and well corked, and would be ready for use. If kept for some time, however, the quality would improve. Another method was to put the apples through a mincer, catch the pure juice, and keep it for two or three years. While the long period required to make vinegar in the latter manner was against its adoption, vinegar made by either method would be found equal or superior to the purchased article. Seeing that this was such a universal household commodity, he was of opinion that everyone who had a few windfall apples should make vinegar for home requirements, and even thought it would pay to buy apples at, say, 4s. or 5s. per case for the purpose. The subject was well discussed. by those present. Mr. T. Jacobs said that by using white sugar instead of brown a lighter vinegar was obtained. He was convinced that apple vinegar could not be surpassed for flavor and general good quality. The Hon. Secretary mentioned that superior vinegar could be made from honey and water. Honey was added to water till an egg would float in it, showing a small part of it above the surface. Waste and inferior honey could be used. The mixture needed at least two years in which to ferment.

Clarendon, February 21.

(Average annual rainfall, 33 $\frac{1}{2}$ in.)

PRESENT.—Messrs. White (chair), Hilton, Dummill, A., H. C., A. A., and E. Harper, Giles, Spencer, and Phelps (Hon. Sec.).

GENERAL FARM MANAGEMENT.—Mr. H. C. Harper read a paper on this subject. At the outset he emphasised the necessity for carefully planning out the work of the farm from time to time. By so doing time would not be lost in the event of weather proving unsuitable for certain operations, as his plan would show numerous small jobs which needed attention. Ploughing should be commenced at the earliest suitable time, and followed up closely, so that the seed could be put in when the first rains came. The difference of a week in seeding time, he said, would often make a difference of many bushels at harvest. It did not pay in his opinion to keep stock when past a certain age. After calving five or six times a cow would return little more than half as much profit to the owner as would a younger one, and sheep after five years old could not produce the same quantity of wool as when younger. His advice, therefore, was to dispose of these animals before they arrived at the ages mentioned. Referring to horses the same could not be said, as, while the present high prices for horseflesh ruled, one could not afford to sacrifice an old animal for little or nothing, and it really was surprising

what an amount of work could be done by an old horse if well cared for and considerably used. More attention, he continued, should be paid to the selection of seed for cereal crops, and the manures used. It was no use to carefully prepare the land and then sow inferior seed. He would, therefore, recommend purchasing good wheat from a reliable farmer. A good discussion followed, in which Mr. A. A. Harper did not approve of seeding after the early rains in this district. He would, in preference, let the weeds come up and then scurry the land before seeding; otherwise a dirty crop would sure to result. The Hon. Secretary could not agree that it paid to keep old horses in a team. As soon as they no longer could do their fair share it paid better to replace them with young stock.

Golden Grove, January 27.

PRESENT.—Messrs. Angove (chair), Maxwell, Tilley, Sabine, Harper (Hon. Sec.), and one visitor.

GRAZING.—Mr. Maxwell spoke on this subject as follows:—"If cows have a fair chance and are properly managed they are more profitable to keep than sheep, but they are a continual tie. They need to be handfed a good part of the year, and are much more liable to disease than sheep. Cows should either have some green swampy ground to graze on in the summer, or be fed on green fodder or ensilage. Pigs are very profitable to keep on a farm or dairy, especially when prices are good, as they have been for some years. If oats and lucerne are sown together early in the season they make excellent grazing for pigs, and with the addition of a little offal they can be reared with very little expense. Sheep may be bought young and kept for wool. Lambs may be bred, or forward stores bought and fattened. The latter have been most profitable with me in the summer months, being handy to market. Young crossbreds do the best, fattening early, and they are not so timid as the Merinos in rough country. If a good paddock of fodder can be grown and the sheep made prime instead of only killable, they are worth 3s. or 4s. more per head. All farmers should endeavor to keep a few sheep, as they are a great help in keeping down weeds. It would pay well to wire-net all holdings near the river where rabbits are bad. Sheep and lambs should have plenty of time on the road to market, as they look bad if over-driven. Good dogs are very useful, but it is better to be without one than to have a bad one." In discussing the subject Mr. Tilley favored the Lincoln-Merino cross. Mr. Sabine considered that cows and pigs were the best for small holdings. If keeping sheep he would have the Shropshire cross, and advocated growing green feed, especially rape. He said nothing responded so readily to change of pasture as sheep, even if only removed from one paddock to another. Mr. Robertson, speaking of pigs, recommended the Berkshire-Essex cross for porkers and Berkshire-Tamworth for bacon.

Kingscote, February 8.

(Average annual rainfall, 18½ in.)

PRESENT.—Messrs. Turner (chair), Bell, Neave, Yeafman, Mitchell, Wright, Tetzlaff, Jacka, Wallace, Cook (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. J. Wright, and the morning was spent in inspecting the property. The vegetable garden looked well, and apple and pear trees were heavily laden with fruit. There was little or no cultivation between the trees, and this members thought a mistake. A cabbage was seen which, without the outer leaves, weighed 16lbs. This and other vegetables were grown without irrigation. Members were of the opinion that as the river was so close irrigation should be gone in for on this farm. They thought a few small windmills would pay handsomely. After dinner, which was kindly provided by Mr. Wright, the business of the branch was transacted, and Mr. F. H. Mitchell read the following paper:—

"**BEES AND BEE-KEEPING.**—It seems to me that the bee-keeping industry should be a flourishing one on Kangaroo Island, instead of, as at present, being conspicuous by its absence. There are numerous shrubs, wild flowers, gums, and cultivated plants from which the honey may be gathered, besides which the climate is ideal. The profits in bee-keeping offer strong inducements towards its adoption and pursuit. A strong healthy colony of bees well cared for, will produce about 75lbs. of honey per annum, which at the present market value is 15s. 6d., besides which it will increase 100 per cent., and there is also the sale of wax and queen bees—the latter being the most profitable of all. The time required in this industry of course depends upon the number of colonies kept; but with wise management this time may be given at any

part of the day or week, and thus will not interfere with regular farm work. Persons starting an apiary should do so in a small way, and first study up questions dealing with the matter. The Ligurian bee, a native of the Gulf of Genoa, in the north of Italy, is, by a South Australian Act of Parliament, the only bee which can be kept on Kangaroo Island. This bee is distinguished by three golden girdles across the back, and the following are its chief advantages over all other bees:—1. They possess longer tongues, and so can gather from flowers which are useless to the black bee. 2. They are more active, and with the same opportunities will collect a good deal more honey. 3. They work earlier and later—this is true not only of the day, but of the season. 4. They are far better able to protect their hives against robbers. 5. The queens are more prolific. 6. They are less apt to breed in winter, when it is desirable to have the bees very quiet. 7. The queen is more readily found, which is a great advantage. In the various manipulations of the apiary it is frequently desirous to find the queen. 8. They are less liable to rob other bees, and are far more amiable. The German bees produce nicer, whiter comb honey than do the Ligurian, but the comb honey produced by the latter is quite as marketable. A good hive is an essential of an apiary. It should be made of pine or other white wood thoroughly seasoned, planed on both sides, and painted white outside. In my opinion the bottom and top should not be fixtures to the chamber, as the hive can then be more easily cleaned. At one end the bottom board should project, and the entrance to the chamber should be here. The frames which hold the comb hang in this box or chamber, and should be placed about $\frac{1}{2}$ in. apart. The apiary should be situated near the homestead. The lay of the ground is not important, though a steep hill is not a good place for it. It may slope in any direction, but better any way than towards the south. Of course each hive should stand perfectly level. Each colony should be shaded. If the hives are subject to the full force of the sun's rays and unprotected they are often covered with bees idling outside, whereas by simply shading the hives all would go merrily to work. The hives may be placed under trees or hedges, but the latter should be trimmed high so as not to be damp, and they may also be placed south of a trellised vine. During winter time bees should be fed if short of food, and the best and cheapest food is granulated sugar or dark inferior honey. To make the syrup add 1 quart of water to 2lbs. of sugar and heat until the sugar is dissolved, then add a pinch of tartaric acid in order to prevent crystallization. The queen bee lays all the eggs, and only one exists in each colony. Queen bees may be improved by breeding in the same manner as poultry, &c. A good way to breed them is as follows:—Remove a comb containing drone cells into the centre of the brood nest. When these drones commence to appear remove the queen and all eggs and uncapped broods from some good strong colony and replace it with eggs or brood just hatched from the colony containing the queen from which it is desired to breed. The queenless colony will immediately commence forming queen cells. In eight or ten days the cells are capped. The bee-keeper must then form a miniature colony of bees - being certain that a queen is not among them. Into this miniature colony a queen cell is inserted. Shortly afterwards the queen will appear, and a week later will have become fecundated. A queen bee not fecundated at the age of three weeks is worthless. The best way to send queen bees from one place to another is by post in specially constructed cases into which has been inserted some moist food. It is worth noting that the queen cell is easily distinguished from other cells, as it is the size and shape of a peanut. There are various ways of preventing bees from swarming, such as keeping colonies queenless in summer. When swarms do get away throwing dust will sometimes cause them to settle, and a fine spray of water always does it. The blowing of horns, ringing of bells, and beating of pans, however, does not the least bit of good in this direction. The following are some of the chief dangers likely to vex the apiarist:—Robbing—Strong healthy colonies will repel robbers, and the Ligurian bee will more especially do this. A further remedy is to close the entrance to the hive so that but one bee at a time can enter or leave. Foul brood—Symptoms: Decline in the prosperity of the colony because of failure to rear brood. The brood seems to putrefy and gives off an offensive stench, while later the caps are concave instead of convex, and many will have little holes through them. A good cure for this is to drive the bees out of the affected hive into a new one by drumming. Force them to fast for three days, and then feed them as before described. Scald the honey in the affected hive and melt the wax. This will destroy the germ. Salicylic acid and borax in equal parts dissolved in water will also destroy the germ. "The disease spreads very readily." Extracts from the Foul Brood Act and from a work by Mr. Langstroth were then read, and emphasis was laid on the absolute necessity for bestowing the necessary attention as outlined in the paper. The paper was well discussed, and Mr. Turner, who has had considerable experience with bees, said that the best time to work among them was between 10 a.m. and 2 p.m., as if they were interfered with in the cold foul brood was caused.

EXHIBITS.—A few small potatoes grown on ironstone country were shown by Mr. Neave, and Mr. Turner tabled some first-class Snowflake potatoes which he had planted in September last, and also a Fordhook squash weighing 18lbs.

WHEAT YIELDS.—Mr. Turner reaped, from an experimental plot of Federation, 26 bush. to the acre, while Petatz Surprise yielded practically the same amount per acre.

Lyndoch, February 27.

(Average annual rainfall, 23in.)

PRESENT.—Messrs. Warren (chair), Kennedy, Klauber, Burge, H. and A. Springbette, Hammatt, Lawrence, Woodcock, Lawes, E. Springbette (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. Lawrence tabled samples of currants, sultanas, grapes, and peaches; also maize stalks 9ft. in height. All these were grown in what is known locally as the "sand scrub blocks" to the west of Lyndoch, and members present considered them to be very fine and clean samples.

CODLIN MOTH.—The Chairman spoke of the codlin moth pest. Some gardens seemed to be passed over by the inspectors, and the owners did not spray the trees nor apparently do anything else to destroy the pest. It was considered that the provisions of the Act should be more stringently enforced.

Meningie, January 22.

(Average annual rainfall, 19in.)

PRESENT.—Messrs. Hackett (chair), Scott, Ayres, T. W. and F. S. Hiscock, Mincham, Tregilgas, and Bolten (Acting Hon. Sec.).

LATE SOWN CEREALS.—Mr. Tregilgas tabled samples of King's Early wheat and White oats. These were sown by him on October 1st and showed a splendid growth of about 2ft. high, with large, well-filled heads.

ONIONS.—Mr. Mincham tabled some Globe onions which were grown by his father on a small plot. They yielded at the rate of 30 tons to 31 tons per acre.

Morphett Vale, January 18.

(Average annual rainfall, 22½in.)

PRESENT.—Messrs. Pocock (chair), O'Sullivan, Rosenberg, Booth, R. and E. Hunt, and Anderson (Hon. Sec.)

LAMBS FOR EXPORT.—Mr. Booth read a paper on lamb-raising for export purposes. He favored for this district Lincoln-Merino crossbred ewes. They were hardy, made good mothers, and reared twins in many cases. They were also fairly good for wool-production, which was an advantage not to be overlooked. For mating with this breed of ewe it was difficult to surpass the Southdown ram. The progeny of this mating would be an evenly proportioned lamb, weighing well, and would do on a minimum quantity of feed. He advised farmers to sow for early green feed some such crops as barley or rye, so as to provide feed for the early lambs until the natural grass would keep them. Lambing, he said, should not begin in this district before the middle of April, as there was no green feed before that time, and young lambs would not thrive on dry feed. If the growth of the lamb was checked at the start it would never regain what was lost. Tailing should be done before the lambs were two weeks old; if left till later they were thrown back by the operation. The best time for tailing was in the morning of a warm day. The lambs should not be hurried when yarding, as they bled more profusely when hot. It was wise to move the sheep and growing lambs from pasture to pasture if possible, as they were then more contented and fed better. Lambs should be from 60lbs. to 70lbs. live weight before being sent to market. In the discussion which followed Mr. O'Sullivan considered the Shropshire ram superior to the Downs for breeding lambs for export. He preferred searing the tails to cutting.

HEAVY WHEAT CROP.—Mr. A. C. Pocock tabled samples of Belatourka wheat grown from seed received from the Agricultural College. This yielded about 6 tons of hay per acre, the sample being 7ft. 6in. in height. It was grown on land under potatoes last season; these were dug in November and the soil levelled with the cultivator. In April the land was again cultivated and 1cwt. per acre of super. put in with the crop. Members wished to know whether this was a record for height. [I do not think so, as a good many years ago we had some sheaves from Golden Grove Branch going about 7ft. 6in. high.—Ed.]

Uraidla and Summertown, February 7.

(Average annual rainfall, 42½in.)

PRESENT.—Messrs. Cobbedick (chair), T. and P. C. Day, Richardson, Rowe, Hart, Hoffmann, Dyer, Harfield, Collins, and Snell (Hon. Sec.).

FRUIT PULP.—A request was received from the Forest Range Branch for co-operation in approaching the Government with a view to the establishment of a plant to pulp fruits in connection with the Produce Department. It was resolved to comply with the request, and a sub-committee was appointed to act with the Forest Range Branch.

INTEREST IN THE "JOURNAL."—As showing the interest taken in the *Journal* reports of meetings Mr. Hoffmann reported having received inquiries regarding his paper recently given on the subject of "Oil Engines" from Mount Gambier and two from Sydney.

SOUTH-EAST DISTRICT.**Lucindale, February 12.**

(Average annual rainfall, 22½in.)

PRESENT.—Messrs. Rayson (chair), Langberg, Carmichael, E. F. and B. A. Feuerheerdt, Tavender, Secker (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Langberg. The visitors first inspected the lucerne plots. The first plot was eight acres in area, growing in white sand, which was formerly covered with ferns. The ferns had been worked out by constant ploughing before the lucerne was sown. This piece had carried 130 sheep from shearing time till five weeks ago. Since then it had grown about 2ft., and looked very healthy. From there members were taken to the engine-house to inspect the pumping plant, which consisted of a portable Crossley oil engine of nine horse-power, working a centrifugal pump with a 4in. output, and a capacity of up to 27,000galls. per hour. The well was 25ft. or 30ft. deep, and was more like a cavern than a well, being about 12ft. x 20ft. It contained nearly 7ft. of water. The pump was set in the well about 4ft. above the water. There were two large platforms in the well. The lucerne patches which had been sown this season were then visited. These were rather thin. There had been about 8lbs. or 10lbs. of seed put in to the acre. Mr. Langberg said it came up nicely, but when the plants were young they were eaten off by grubs or insects, and he found it a very difficult matter to get the bare patches filled in. Irrigation was carried out by means of fluming, of which there were several chains on the property. Refreshments were kindly provided by Mr. and Mrs. Langberg.

Mount Gambier, February 19.

(Average annual rainfall, 31½in.)

PRESENT.—Messrs. Sassanowsky (chair), Schlegel, Wedd, Holloway, Smith, Dow, Kilsby, Ruwoldt, Major, Holding, Sutton, and Collins (Hon. Sec.).

FODDER GRASSES.—Mr. Holding showed a good sample of *Panicum crusgalli* grass, grown by him at Wandilo from seed received from Murray Bridge. He sowed it in November, and for several weeks it was grazed to the root. He was so pleased with it that he intended to put in 10 to 20 acres this year. Another fodder he showed was Sheep's Burnett. He grew the sample at Wandilo, on damp land. Mr. Smith had tried this plant last year, but with him it did no good. Mr. Holding also exhibited a sample of Red Top grass. When he was in New Zealand it was spoken very highly of, and he brought some seed, and grew this at Wandilo. He thought it also required a dampish soil. It was a hardy grass. All three were summer grasses. He tried seven grasses, and these were the best.

APPLES.—Mr. Wedd tabled some fine seedling apples grown by him at Ardno. He grew them as a hedge, and they received no cultivation.

AGRICULTURE IN EUROPE.—A long and interesting paper on his recent trip to Europe was read by Mr. Schlegel. The trip from the Outer Harbor to Southampton was described, including the more interesting features of the different ports of call. The reception accorded him in England and certain places visited were touched upon, and then the paper continued—"Kent is the great county for hops, and a pretty sight they are. There is not so much corn grown as formerly, but more grazing is carried on, and also great quantities of strawberries are raised

for the London market. Much fruit is raised under glass and artificial heating, such as grapes, and afterwards sold in London from 6s. to 7s. 6d. per pound. Peaches are sold at from 13s. to 16s. per dozen. Apples, cherries, and plums, and most of the berries are cheap, many of the latter growing wild in the woods and hedges. The cattle stocked in Kent are mostly of the deep red Devon breed. The sheep are mostly Romney Marsh (a few Southdowns are kept), and are, as a rule, shorn on the green meadow, and cut from 9lbs. to 11lbs. of good, clean wool. The wool is not skirted, but just rolled up, with the belly put in, and the neck drawn out like a hayband, and then wound round the fleece, and put into a bin. They are of fine bone, but weighty. They develop stouter bone in Australia. I saw some fine Dorset Horns in Dorset and Hampshire. The pastures are good, mostly rye grass, Timothy, and various clovers. The soil is deep, heavy clay, of a blue black to a dark soap color, and the ploughing is mostly done with one-furrow ploughs, drawn by two or three horses, and generally they all walk in the furrows, the leader being led by a boy. Of course, on larger estates two and three furrow ploughs are used. They plough deep, 6in., 8in., and 9in. to a foot, with heavy implements, every time in strong, stiff soils. The horses are of good quality, but over fat as a rule. Carriage horses and hacks are of a good stamp. I saw some fine Irish hunters, both in England and in Germany, but was sorry to see in England how they cropped their tails, making their appearance, to an Australian, absolutely ugly, and cruel, for they have no protection against the sting of the troublesome flies. It is held that this style of cropping shows off the horses' good points, but to me it looked like a cap with the peak torn off, or a handle stuck into a barrel. The meadow hay was a partial failure on account of so much rain. Much beautiful clover cut rotted in the fields. There is a great deal of trouble in making hay in the old country, as it has to be continually turned when a fine sunny day offers, which is very seldom. There were some very fine crops of oats, barley, and wheat; also much horse and broad beans. The latter crop is very often preyed upon by the pheasant, but the birds may not be destroyed under penalty of imprisonment. Ploughing is done thoroughly everywhere, and the land well worked afterwards before seed of any kind is put in. Seed drills are mostly used, and much manure, especially farm yard. In Scotland I was surprised to find so many potatoes grown, large areas being under the crop, and often 12 to 13 tons to the acre dug. At Dalmeny, Lord Rosebery's estate, 16 tons were being dug the day I was there. The potatoes are very often put into barrels, similar to those used by the Canadians for their apples, instead of into bags. The crops of oats and barley round about Stirling were very fine, and in other parts of Scotland there were splendid yields, but a great quantity was damaged by continuous rains. Large crops of turnips are also grown under heavy farmyard manuring. I was much struck with the country and its Highland cattle and black-faced horned sheep. I think we might try some of them on our rough country, as they seem very hardy, and do well on rough bleak hills. I came across other fine breeds, such as Polled Angus and red and black cattle, which are in great demand in the English counties for fattening. I also saw some very fine Ayrshire cattle." Having described various other places of interest visited and the crossing of the Channel, the paper continued—"The French seem to be great cultivators, every little patch of ground seemed to have a crop of some sort on it; so different from England, where so much is under wood or grass. Horses did not impress me. The draughts were of lighter build, perhaps bred more up to artillery or other military requirements, as in Germany. We might all take a hint from this. The main crops consist of rye, sugar beet, potatoes, peas, beans, wheat, barley, and oats, and dairying is also carried on extensively in parts. Thence Switzerland was visited. This is a wonderful country, with its perpetual snow-clad peaks and rich broad valleys and hills. The milk everywhere is both plentiful and very rich, and much dairying is done. The cattle are taken up into the mountains in summer and milked, and in November are brought down to the valleys. I visited Nestle's milk factory. Milkers are mostly of the Jersey or Alderney cross with Holstein Friesien cattle, and the bulls are all owned by the authorities of the different cantons, and are not allowed to roam, as here, with the cows. The cows are fine sturdy animals, not too big, but by no means small. They have fine points from a milking point of view. Some are all yellow, yellow and white, fawn, fawn and white, light brown, and some black and white, and so on, and none brown or dark roan. Each canton seems to have cattle of one color, and differing from the colors of other cantons. Of the places visited Lucerne and Zurich interested me most. I did a lot on foot from place to place, and never got tired, the air being so very fresh and rarefied. Every little patch of clover is cut and made into hay, and has to be carried down on the backs of the people. I do not think I enjoyed the meat so much here as in England and Scotland; it did not seem so juicy. Tea is very little drunk, mostly light wines, coffee, and chocolate. But the dark rye bread, nicely buttered, is very sustaining, and with Swiss cheese went well with us on our mountain journeys. We then crossed over into Germany and Schaffhausen. The journey to Heidelberg is through some long stretches of fertile country, intensely cultivated. Most of the corn crops were just beginning to ripen, and the rye was being cut. Potatoes and sugar beet are also extensively grown, and much meadow hay is made of beautiful clover. Stock were all in the pink of condition. Heidelberg and its castles and the view across the River Neckar were very fine indeed. I saw the great oaken wine casks. The largest was said to have contained 32,000 quart bottles of wine. From here to Wiesbaden is very fine agricultural country, with

here and there small flocks of sheep and cattle, all being herded, as there are no fences to be seen on all this long stretch of country from through France to here. Only a garden may be hedged in. I was struck with the immensity of Germany's agricultural area. Horse-breeding is extensively carried on in some of these States. The horses are of a fine stamp and of a high-class blood, and the stoutest Suffolk Punch predominated. You do not see such a mixed medley of breeds, shapes, and sizes as in Australia in the European countries. Horse-racing is also getting a big hold on the Continental countries, especially in Austria. Berlin has a very fine trotting track. Next on to Dresden passed through some very fine grazing and agricultural country and orchards. Many miles of the roads and by-ways are planted with plums, prunes, cherries, and other fruit trees, and these fruits are sold on the trees, so much for a given number, and the revenue more than keeps the roads in the best of repair. Could we not adopt such a system of income to the upkeep of our much cut-up roads? I visited famous art galleries and opera houses and our ancestral home, which has been in the possession of the Schlegel family since 1562. It is now owned and worked with success by my cousin, Oswald Schlegel. It is a beautiful property. The cultivation is thorough, and the crops on it were a picture to see. The stock were in the pink of condition, fine big dairy cows, something of the Shorthorn breed, with a dash of Holstein. I also saw the estate that my grandfather was manager of, and here there are still many fine Saxon-Merino bred sheep, from which stud many have found their way to Australia. Of late years they have been giving more attention to lamb-raising, and I was surprised to see Shropshire rams and Leicester ewes on the place. Merino wool growing does not pay, they say, as well as lamb-raising, as it can be procured so much cheaper from Australia; but they have still some very fine stud merinos. Towards Hamburg better agricultural areas are seen. Good cultivation and much manure is used everywhere. I forgot to mention that much liquid manure is used in Europe on the meadows, run out in large barrels on wagons. In and around the eastern part of Prussia I saw good cultivation, stock, and cattle raising farms. They all plough deeply, and work the ground well afterwards, as in England and Scotland, and use plenty of manure. They keep good horses and fine cows, all in excellent condition. Thence we passed through Schleswig-Holstein, famed for its grazing and agricultural country. I here saw some very fine cows, with udders so full of milk that they could hardly walk. Fine pastures and good crops, but they were getting too much rain, and the wind had knocked them down in places. I could not see that Europe could teach us much in the way of cultivation. They do everything well, of course, but too slow for Australians to follow. Their implements, as a rule, are too heavy for our requirements. But in regard to dairy cattle, they are much better cared for, and, of course, give better returns. I did not see a poor beast in all my travels; they were kept on the best of pastures, and so yielded good returns. They do not mind ploughing a good swarth, they say, thus giving the cows the pick, and not as here, often only rubbish and weeds to clear up." [We regret that it has been absolutely necessary, owing to lack of space, to omit portions of this paper, which, while of great interest, had little direct bearing on agricultural questions.—Ed.]

Tatiara, January 22.

(Average annual rainfall, 19½ in.)

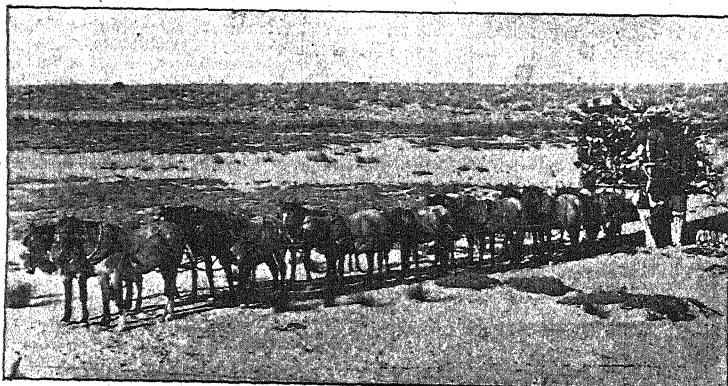
PRESENT—Messrs. Saxon (chair), Staude, Prescott, Wilson, Reschke, Watson, Duncan, Milne, Fisher, Stanton, Bond, and Truman (Hon. Sec.).

FARMERS' WHEAT SHEDS.—The Chairman referred to the erection of wheat sheds in New South Wales by the Railway Department for leasing to farmers, as described on page 376 of December issue of the *Journal*. He thought it a matter that the Bureau should discuss. If such a building were erected at Bordertown it would be of great benefit. Mr. Wilson did not know if there was sufficient wheat grown in Tatiara to warrant the expenditure of a large amount. It would mean that farmers would have to put their names to a document to guarantee the expenditure for the time allotted, and whoever signed the petition to the Government would be responsible for the amount, unless they received a guarantee from others, or became lessees from the Government. The Chairman was of opinion that farmers would take it up. Every man who had 500 bags or 700 bags of wheat that he was not prepared to sell, would take advantage of the storage, knowing that it would be safer under his own protection than if placed in a merchant's hands. It should not be difficult to get the money from the Government if the farmers were unanimous about the shed. Mr. Reschke thought a site should be obtained from the railways, and have the management under trustees, the farmers to give a guarantee. Mr. Stanton said a storage shed was what the farmers wanted, and Mr. Wilson said that from a miller's point of view it would be a good thing. If he knew where to secure a parcel of wheat at short notice, he would be prepared to give a little more in price to secure it

sooner than miss trade. It was decided to ask the Railways Commissioner if he would permit the erection of a shed on railway land, and to solicit the interest and aid of the Government in the matter.

NOXIOUS WEEDS.—An informal discussion took place on the rapid spread of star thistle. Mr. Stanton said there was enough of the weed between Bordertown and Wolseley to seed the Tatiara. Some farmers did not bother about it, as after rain sheep would eat the soft tops. He did not think it a matter for the Bureau to deal with, as it came more under the sway of the district council. This body should see that it was kept under. Mr. Reschke said that the seed was not carried by the wind like Scotch thistles; it just fell around the stalk. After rain sheep would eat the weed.

COMPETITION AND FRENCH WHEATS.—Mr. Milne reported the following yields from the competition wheats grown by him on behalf of the department:—Federation, 22bush. 35lbs. per acre; Crossbred No. 53, 21bush.; White Gamma, 20bush. 36½lbs.; Red Gamma, 20bush. 14lbs.; Selected Comeback, 19bush. 35lbs.; Purple Straw, 21bush. 41½lbs. He considered that all the varieties were suitable for the district, and placed Crossbred No. 53 as the best; although it did not yield so much, the grain weighed heavier. It was, however, a heavy shafted wheat and difficult to clean. Comeback was a good plump grain, and he also liked the two Gammas. Crossbred No. 53 produced a great number of plants to the acre, but after stooling they failed to develop, and he thought the sowing of $\frac{1}{2}$ bush. to the acre would be sufficient. The grain, which was brittle, set very quickly, the plot being ready to strip as soon as the others. Mr. Milne also reported that he had made a trial with three varieties of French wheats received from the department. They were Red and White Marvel and Treasure. The yield was not great, but he thought they would be suitable to the district. He intended to make further trials with this grain. One plot had resulted well, but the others were poor. The Continental varieties were wheats that would shake out easily, one touch of the swingle-bar when passing being sufficient to shake out the whole of the grain.



CARTING FIREWOOD IN THE INTERIOR.

THE JOURNAL

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Department of Agriculture OF SOUTH AUSTRALIA.

No. 9.

APRIL, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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All communications to be addressed:

"The Editor, Journal of Agriculture, North Terrace, Adelaide."

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T PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Some Roseworthy Students.

An interesting fact in connection with the annual distribution of prizes at Roseworthy College was that an old student should submit the Principal's report. Mr. W. J. Colebatch, who is acting as Principal during the absence of Professor Perkins, was gold medallist in 1898. After completing his course he visited Great Britain to continue his studies, and gained the degrees of B.Sc. and M.R.C.V.S., after a successful career. For several years he was on the staff of the Lincoln (New Zealand) Agricultural College; then later in the service of the Victorian Agricultural Department. Another successful student in the person of Mr. A. E. V. Richardson, B.A., B.Sc. (Assistant Director of Experimental Agriculture), was also present on the occasion referred to. The Acting Principal mentioned in his address that he had secured good appointments in Western Australia for two of this year's diploma students. It may be worth mentioning that several other members of the College staff and the officers in charge of the experimental farms at Kybybolite, Loxton, and Shannon each hold the College diploma.

The United States Wheat Harvest.

The "Official Crop Reporter" for the United States puts the 1909 wheat crop at 737,189,000bush., from 46,723,000 acres, the average being practically 15½bush. per acre. The acreage shows a falling off from the previous year's figures of over 800,000 acres, while since 1901 the area under wheat has decreased by over 3,000,000 acres, notwithstanding the large areas of land which have been taken up in the semi-arid regions for farming. The oat crop totalled 1,007,353,000bush., being nearly 50 per cent. greater than the wheat harvest.

Heavy Wheat Exports.

The bountiful harvest is reflected in what is almost, if not quite, a record export of breadstuffs during the first three months of the shipping, notwithstanding the fact that the season was later than usual in opening. From December 1st to February 28th wheat and flour equivalent to 9,600,000bush. have been shipped as compared with a little over 9,000,000bush. for the same

period last season. Up to date this season Port Adelaide has shipped 3,200,000bush., Wallaroo 2,480,000bush., and Pirie 2,171,000bush. Exports during the month of March have also been very heavy, and will be little (if any) less than the February record of 3,409,000bush.

Progress of Pinnaroo District.

The progress made in the district served by the railway line from Tailem Bend to Pinnaroo is little short of marvellous. Five years ago many authorities doubted whether the district warranted the construction of a railway; to-day improved farms are selling up to £6 per acre, while the yield from the district for the past season is expected to exceed 1,250,000bush. The following figures, taken from the official statistics, with the exception of 1909, will indicate the progress made—1905, 34,450bush.; 1906, 122,147bush.; 1907, 181,361bush.; 1908, 777,288bush.; 1909, 1,260,340bush. When it is remembered that the greater part of the lands allotted in this district is still covered by scrub, and that the proposed railway to Brown's Well is expected to open up about 1,500,000 acres, it will be recognised that in the development of the country east of the River Murray we have practically added a new province to South Australia.

Peaches for Canning.

The Horticultural Instructor (Mr. G. Quinn) writes—"Those who propose to plant peaches for the purpose of canning would do well to have a chat with the leading canners before selecting their varieties. Up to the present such kinds as Early Crawford, Elberta, Muir, Lady Palmerston, and Selway have been grown for canning purposes, largely, no doubt, because they are freestone varieties and are all suitable for drying purposes. It should be borne in mind, however, that in all countries of the world, such as in Italy and California, where peaches are produced on an immense scale for canning purposes, the freestone varieties have been abandoned in favor of the clingstones. Clingstones possess a pulp of much closer and tougher texture than the freestones, and in a fresh state the yellow-fleshed varieties are not to be compared with those having stones which part freely from the pulp. Those who have carefully experimented cannot but be convinced of the fact that this toughness is a point in favor of the clingstone, because the pulp does not break up or become too much impregnated by the watery syrup. Further, the whole of the flavor of the clingstone appears to be conserved, if not actually improved, by the cooking process undergone in canning. It is a well known fact that the delicate flavor which makes most of the

freestones so desirable as dessert fruits are almost entirely destroyed when the fruits have been heated. The main argument of the canners against the utilisation of the clingstone varieties has been the difficulty and expense of extracting the stones from the pulp, but this difficulty has been largely overcome by the employment of special spoon-like instruments invented for the purpose, and machines may also be utilised in the peeling of the fruit. Owing to the pulp of the fruit adhering to the stone, the gripping prongs of the machine are enabled to hold the fruit firmly, even when it has reached a stage of ripeness. Freestone fruits in a similar state of ripeness could not undergo this operation. Anyone who has had a few hours' practice in peeling clingstones with an American machine and extracting the stones with a properly adapted spoon, soon becomes so expert that the pits are removed almost as quickly as in the case of the freestones, and the gritty, colored particles of pulp which surround the stone are effectively removed, being almost the only portion of the flesh which is wasted. In consequence of the removal of this colored pulp the syrup remains uncolored, and fine, clean-margined halves are the result. There can be no question that before we are able to go outside of Australia with our canned peaches we will have to do as other countries have done, and utilise the high-colored clingstone varieties, many of which are now coming to the fore; and no doubt some of them will prove to be as good yielders and will thrive as well as the now popular freestones. I have seen clingstone peaches which were canned in Italy taken out of the tins, passed through hot water to cleanse them, and packed in flint-glass bottles in fresh syrup, after which they bore all the appearance of freshly bottled fruit without the loss of any flavor."

Cockspur as Fodder.

The necessity for exercising considerable caution in condemning any plant as useless for fodder is well illustrated in the case of the plant commonly known as cockspur. At one time we believe attempts were made to compel landowners to destroy this as a noxious weed, and the contention of many farmers that it was a useful fodder was ridiculed. It has, however, been recognised now for a good many years that it has a value altogether out of proportion to what its appearance would indicate. Mr. J. V. Whyte, of Angoorichina, states that around the Blinman district the cockspur has practically proved the salvation of the country. The rabbits have eaten out most of the native grasses and much of the bush, but the cockspur seems to be too much for them, while at the same time sheep will eat the young plants, the flower heads, and also the old plants when they are dead and softened by exposure to the weather. Cattle will do well on the plants when young, but do not care for it once it gets hard, whereas, curiously enough, Mr. Whyte states that horses will only eat it when it is old and dry.

Planting of Fruit Trees.

The Horticultural Instructor (Mr. G. Quinn) writes—"Intending planters of fruit trees will act wisely if they place their orders at once with reliable nurserymen. With regard to the planting of different kinds of fruit trees, the results of the last few seasons indicate that care should be exercised in the planting of plums. With exception of valuable kinds of prunes which may be dried, there is no doubt that those who have had experience will refrain from increasing the number of their plum trees. To the newcomer, however, a word of warning may be desirable. There are at present throughout our hilly districts thousands of plum trees of excellent sorts, but for the produce of which there is at present no demand. Tons of the most beautiful plums for jam-making were sold at unpayable figures during the past season here. It would seem advisable that, as there is a dearth of this fruit every two or three years, if the growers could co-operate and establish a pulping plant, wherein these plums could be brought to a condition in which they could be kept until required, there might be more value attached to their cultivation. At the present time it is suggested that only sorts such as Prune d'Agen, Fellemberg, and Splendour be planted. Advices recently received from London indicate that some of the Japanese hybrid plums, which come to such a high state of perfection here, will yet find a footing in European markets. Of these the most promising varieties appear to be Climax and Wickson. Another variety of the Japanese strain known as Wright's Early will doubtless, owing to its extreme earliness and good qualities, come to the front for putting on the local market. Amongst apples the export trade seems to be centering itself more and more upon a few varieties, such as Jonathan, Cleopatra, Dunn's Seedling, and Rome Beauty. The Jonathan thrives in the wetter and colder districts, and is practically immune to bitter pit. Rome Beauty may also claim these qualities, and Dunn's Seedling and Cleopatra are essentially dry country apples, and thrive best in districts where the rainfall is from 20in. to 25in. If Dunn's Seedling be planted in wetter localities it cracks badly around the stalk, and becomes almost useless. The Cleopatra displays unusual susceptibility to bitter pit in wet localities. Amongst pears Glou Morceau, Beurre Bosc, Beurre Clairgeau, Josephine des Malines, and Winter Nelis claim special attention; but there is no reason why the Victorian raised, fine keeping pears, such as Madame Cole and the well-known Beurre Diel, should not be planted."

Roseworthy Laying Competition.

The sixth laying competition, which terminated on March 31st, resulted as follows:—Prizes are given for highest market value of eggs laid. Section I., White Leghorns only—1st, C. B. Bertelsmeier, of Clare, whose

bird laid 1,331 eggs in 365 days, as against the previous record of 1,531 eggs in 366 days ; value £5 17s. 1d. 2nd, A. J. Cosh, Normanville ; 3rd, Sargentri Poultry Yards, East Payneham ; 4th, E. A. Pidder, Burnside ; 5th, F. E. Hannaford, Murray Bridge. Section II., all other breeds—1st, Carolina Egg Farm, Fullarton, whose pen of Black Orpingtons laid 1,190 eggs, valued at £4 17s. 7d. ; 2nd, Carolina Egg Farm ; 3rd, W. C. Wurm, Parkside ; 4th, B. P. Martin, Unley Park ; 5th, Kappler Bros., Warrow. In all there were 113 pens == 678 birds, and the eggs laid numbered 126,133 ; the market value of these was £470 12s. 5d. It cost £187 0s. 8d. to feed the birds, so that the profit over cost of food was £283 11s. 9d. The average cost of food for each hen was 5s. 6·19d., and the profit per hen over cost of food was 8s. 4·2d.

The 1910-11 Laying Competitions.

This year laying competitions are being held at Kybybolite and Roseworthy Poultry Stations. At Roseworthy there are 98 entries each of six pullets. The competition is divided into two sections—section I., light breeds ; section II., heavy breeds. The test terminates on March 31st, 1911. There would have been many more entries but for the ravages of foxes. At Kybybolite there are two sections—section I. for South-Eastern breeders only, and section II. open to all comers. There are in all 44 entries. Valuable data may be expected from these competitions, as in many cases breeders are represented at both, and some information as to climatic effects may be obtained. On the whole a fine lot of birds have been forwarded, and the hope is expressed that high averages will result at both localities.

Autumn Tillage.

The Horticultural Instructor (Mr. G. Quinn) writes—"The rains which fell during March have had a tendency to start a strong growth of weeds in most of the orchard lands. In most localities it is scarcely desirable to attempt to destroy these, because—and more particularly on steep slopes—they will tend to bind the surface of the ground and prevent erosion. Further, the stimulation of the growth of the trees late into the autumn is a very doubtful practice. The rain has caused a second growth, and it is desirable to allow the ground to dry as rapidly as possible now, so that the growth may be ripened at a reasonably early period. This is more particularly necessary in the case of trees which are at a fruiting age, otherwise the maturing of the flower buds may be prevented, and next season buds which promise to break into bloom may turn out to contain nothing but leaves. The late tillage for the mainte-

nance of moisture until the winter rains begin, and the continuance of growth on the tree, can only be justified in the case of young, and old trees which have become impoverished. In this case it is desirable to obtain strong vigorous growth to build up the framework of the young, or renovate the old tree. This has been a splendid season for the planting of green crops in the orchard, such as peas, vetches, etc., which are to be turned under to make green manure. It is when there is a heavy soaking fall of rain early in March while the ground is still warm that the orchardist has an opportunity of putting a scarifier through the land between the rows of the trees and drilling in the required crop. The warmth and moisture give these leguminous crops such a strong start that, as a rule, they have made a greater proportion of their normal growth before the temperature of the soil descends below the necessary warmth required for growth. Such a crop consequently will carry a very heavy weight of foliage, and the stalks should be in a fit condition to return a large quantity of humus to the soil at an early period in the spring, while there is yet enough moisture in the ground to decompose the inverted mass."

A Wonderful Cow.

The Massachusetts Experimental Station has just issued an official report of a 12 months' test of the Guernsey cow "Dolly Dimple." At the beginning of the test she was just three months short of four years of age, and had calved five days previously. During the 12 months she produced 18,458·8lbs. of milk containing an average of 4·91 per cent. of fat, equal to a total yield of 1,058lbs. of butter. Her best month's return was 1,909·6lbs. of milk, and the lowest 1,105·1lbs. On one day she gave 68·4lbs. of milk. Naturally, such a wonderful yield was only given on a liberal feeding ration; but, assuming the butter to be worth only 10d. per pound, we have a gross return of £44, from which a liberal food bill can be paid and still leave a big profit. "Dolly Dimple's" record is the best ever made by a Guernsey cow, and has rarely been exceeded by any breed.

Imports and Exports of Fruits and Plants.

During the month of March 3,686bush. of fresh fruits and 12,219 bags of potatoes and 48 packages plants were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act. Ninety-six bushels of bananas were destroyed. The exports to inter-State markets comprised 8,920bush. of fresh fruits, 3,154 packages of vegetables, also examined at Adelaide. In addition 15bush. of fresh fruits at Stirling North, 91bush. at Salisbury, 160bush. at Angaston, 310bush. at Clare, 32bush. at Laura, and 134bush. at Wirrabara were inspected and passed by the inspectors at those

places. Under the Commerce Act, 91,098 cases of fresh fruits, 161 packages preserved fruits, and 325 packages of honey were exported to oversea markets during the same period. These were distributed as follows :—For London, 58,208 cases apples, 2,990 cases pears, 88 cases grapes, 324 packages honey, and one preserved fruit ; for Germany, 25,135 cases apples, 362 cases pears, one package honey, and six packages preserved fruit ; for India and East, 2,439 cases apples, 19 cases pears, 37 cases grapes, and 81 packages preserved fruit ; for New Zealand, 1,820 cases grapes, and 80 packages preserved fruit. Under the Quarantine Act 1,504 packages of plants, seeds, bulbs, &c., were examined and admitted from oversea ports.

International Agricultural Congress.

An International Congress of Agricultural Associations will be held at Brussels in September, 1910, in connection with the Brussels Exhibition. It is pointed out in the preliminary programme that the association of growers in societies and unions constitutes one of the most powerful factors in the advancement of agriculture. The methods adopted in different countries even for the attainment of similar objects vary very greatly, and it is thought that the comparison of the various systems and the discussion of methods in an international assembly will be productive of good results. Some other matters of importance to the grower, such as the improvement of roads and the diminution of agricultural labor will also be included, but the Congress does not propose to touch on technical or economic questions connected with general agriculture or its allied industries. The Congress will be divided into ten sections as follows :—(1) Societies representing agriculture or horticulture in general ; (2) Farmers' Associations, Societies, or Clubs ; (3) Associations for production (cattle and sheep breeding, milk control, improvement of seed) ; (4) Societies for co-operative manufacture, purchase, export, sale, consumption etc. ; (5) Credit banks and Societies for live stock insurance and other forms of thrift ; (6) Demography and hygiene (including housing) ; (7) Agricultural labor ; (8) Means of transport ; (9) Other measures for the improvement of the condition of the agriculturist, including public lighting and water supply, public amusements, diffusion of small holdings, rural housing, market gardening for workmen, &c. ; (10) Organisation of inquiries, shows, and exhibitions, distribution of information by agricultural societies, &c. Societies or private persons can participate in the Congress, the subscriptions for each person or representative being 15 francs. The office of the Congress is located at 220 Chaussée d'Alsemberg, Brussels.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

"Shannon" writes—"I wish to know the malady of a horse which died from the following symptoms:—First symptoms appeared in August, 1909; refused food, would eat grass in paddock, but not chaff picked up in paddock, but got poor when stable-fed. Kept falling away, and just previous to death got stiffness in the joints. Time from first symptoms till death—six months. Opened beast after death and found all organs sound, with the exception of the liver, which was covered with lumps varying in size from $\frac{1}{4}$ in. to $2\frac{1}{2}$ in. diameter; the largest of these lumps appeared cracked."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"The disease was evidently a form of cirrhosis of the liver. Farmers should send interesting specimens from animals to the Stock Department for examination. The specimens should be immersed in a 2 per cent. solution of formalin."

TREATMENT OF HORSES OVER-FED WITH WHEAT.

"Anlaby Settler" writes—" (1) What are the best measures to take in case of horse eating overdose of wheat? (2) Some simple remedies for a farmer to keep on hand to meet the emergency. Some farmers recommend giving them a drink of water and then gallop or trot them smartly; others recommend no water. I would like the veterinary's opinion on this."

The Government Veterinary Surgeon replies—"Give the horse the following draught as soon as the case is diagnosed:—Turpentine, 2ozs.; aromatic spirits of ammonia, 2ozs.; raw linseed oil, 1 pint; mix. An enema of soap and water, or linseed oil, soap, and water, should be given and repeated in two or three hours. Gentle walking exercise and massage to the abdomen prove beneficial. If acute symptoms continue, aromatic spirits of ammonia in 2oz. doses should be administered in a pint of water every two hours. Water should be withheld until all acute symptoms have subsided. Should laminitis supervene, the feet must be placed in cold baths or in clay."

COLD IN MARE.

Correspondent at Lameroo writes—" Will you please prescribe for a mare which contracted a cold at the time of being relieved of a dead foal. The mare was in good condition at the time. She coughs very distressingly especially during feeding."

The Government Veterinary Surgeon replies—" Give the mare a ~~water~~ glassful of the following mixture once daily in the food :—Concentrated infusion of gentian, 7ozs., added to 1 quart of caron oil, and mix. Shak. well before using."

PARTIAL SMUTTING OF WHEAT EARS.

" J. F." and " Parrakie " forward samples of wheat ears in which some of the grain is sound and the rest smut, and ask how this is accounted for.

Mr. W. L. Summers (Secretary Advisory Board of Agriculture) replies—" During the past few years numerous instances of this partial infection of wheat ears have come under notice. Sometimes only one side of the ear is affected, at others only the lower part of the ear is diseased, and in one instance part of the grain itself was sound and part smutty. These samples have at different times been submitted to Professor McAlpine, of Melbourne, the recognised Australian authority on diseases of wheat, and he replied as follows :—' In the partially bunted grain the fungus had evidently exhausted itself in producing its spores only on one side. The fact that the whole of the starch was not utilised in the formation of spores might be due to the slow growth of the fungus, enabling the contents of the grain to harden, so that the fungus could not penetrate. In all these cases—where smutted and sound heads are found on the same stool, or smutted and sound grains in the same ear, or even where the grains are only partially smutted—the explanation is the same, i.e., that by some accident of growth the fungus did not reach its full development, and was unable to reach all parts of the plant as it generally does.' "

PICKLING SEED WHEAT.

" H.W." asks—" Can you inform me just what 1 per cent. solution of bluestone means in dealing with the pickling of seed wheat, and did Mr. Richardson use English or colonial bluestone in his pickling test at Parafield?"

Mr. Richardson states—" That the bluestone used was the ordinary supplied for analytical purposes, and he is unable to say whether it was made in England or not. This, however, is immaterial, as any bluestone crystals showing a good blue color would give the same results. By a 1 per cent. solution 1lb. bluestone to 10galls. of water is meant.

FUNGUSINE FOR PICKLING WHEAT.

"W.D." Frankton, writes—"Having read in *Journal* report of pickling tests, I would like to try fungusine this year. Would you please tell me where this is procurable?"

The Editor replies—"Particulars concerning fungusine are advertised by Messrs. J. Bell & Co. in this month's issue of the *Journal*.

SPLITTING OF PEACH STONES.

"W. H. N." Booleroo, writes asking the reason why stones in peaches split when the fruits are getting ripe. The Horticultural Instructor (Mr. G. Quinn) replies—"Without local knowledge of the climatic and other conditions prevailing, it is difficult to express an opinion why the stones of your peaches should split. Some varieties, such as Early Rivers, are constitutionally weak in this respect, and the majority of the pits part at the sutural line. In other cases it is sometimes due to the conditions which prevail around the root system, and frequently the application of water has a tendency to cause this defect. For varieties the stones of which show a tendency to split it is desirable that the conditions of soil moisture be maintained as evenly as possible, so that the stones may develop and ripen in keeping with the growth of the fruit. The dividing of the stones is due to the unripened condition of the sutural joints, and an exceptional rush of water through the tree has a tendency to prevent proper lignification of this portion. Sometimes an abrasion, which exposes the slightest area of this joint to the air, and the action of organisms which are contained therein will cause the splitting complained of. For instance, some of our native leaf-rolling caterpillars belonging to the genus *cacoccia*, gnaw away small areas, particularly around the stock, and thus cause degradation of the sap, and the damage in the direction indicated above. It will be seen that the gradual healthy growth of the tree should be maintained by cultural methods, and by preventing the attacks of insects. Frequently autumn rains upset all one's calculations in this respect by producing a superabundance of moisture in the soil."

SOME GOOD HEADS OF FEDERATION WHEAT.

By W. L. SUMMERS.

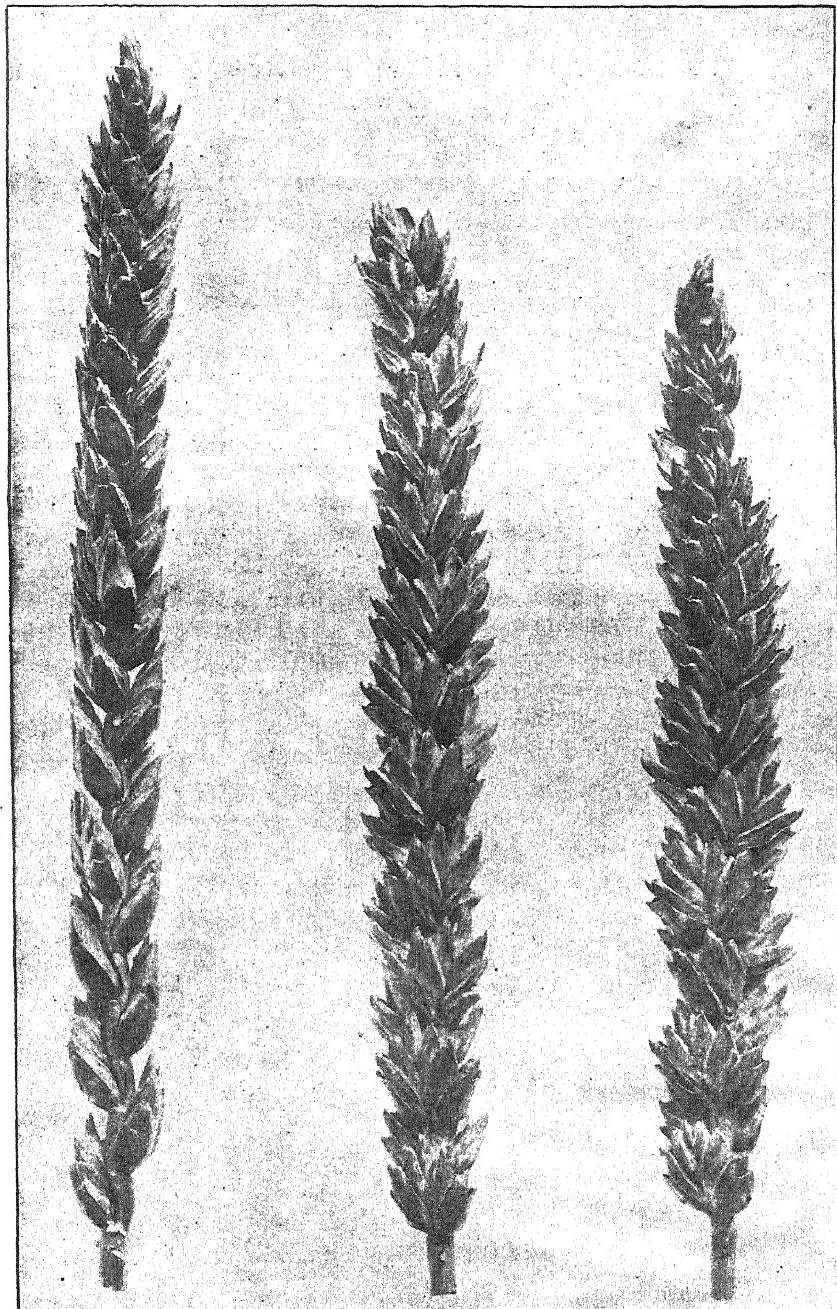
It is questionable whether any wheat ever introduced into this State has so rapidly become popular and has proved itself adapted to such a wide range of conditions as Federation. This wheat was bred by the late Wm. Farrer in New South Wales about 10 years ago as a result of a cross between Purple Straw and Yandilla, the latter being the result of a cross between Improved Fife and an Indian variety. Mr. Farrer's special aim was to produce a prolific yielding wheat on a strong but short straw, and in Federation he undoubtedly succeeded in his object. In 1901 he sent out a small quantity of this new wheat to several experimenters, including Mr. F. Coleman, of Tuela, Saddleworth, to whom is due the credit of proving its worth and introducing it as a commercial variety in this State. Five years ago this wheat was practically unknown, but to-day it is one of the most popular varieties over most of our wheat-growing areas.

Generally speaking Federation yields considerably better returns than the appearance of the crop leads the grower to expect. The short straw and relatively small heads are deceptive, but usually the heads are exceptionally well filled, and the grain weighs well. In this State the grain is of fair milling quality. This season, however, New South Wales millers are reported to be docking it to the extent of 1d. and even 2d. per bushel.

Our illustration shows three unusually well-developed heads of Federation wheat grown on the farm of Messrs. Thomas Goode & Sons, Mintadloo, *via* Farrell's Flat. Mr. Clarence Goode, M.P., one of the firm, brought about 20 heads which would average almost as well as No. 2 in the illustration.

In all these heads many of the chests contained five grains, and in quite a number of instances there was a sixth—small, it is true, but quite plump. Of the heads illustrated No. 1 carried 28 chests with 113 grains; No. 2, 24 chests with 97 grains; and No. 3, 26 chests with 101 grains—an average of four grains to each chest. The crop from which these heads were gathered was sown in May, 1909, on fallowed land. It started well, but on a few limestone ridges it came up rather thinly compared with the rest of the field. These thinner patches stood out wonderfully, the heads generally being well filled, carrying three, four, and even five grains on most plants. The return from 240 acres went about 35bush. per acre; and Messrs. Goode & Son state that in their opinion the thinner patches yielded almost, if not quite, as good as the rest of the crop.

HEADS OF FEDERATION WHEATS (Natural Size).



1

2

3

PRIZES FOR IMPROVED WHEATS.

In his opening address at the Annual Congress of the Agricultural Bureau in September, 1905, the Hon. L. O'Loughlin (Minister of Agriculture) referred to the work being done at Roseworthy and Parafield to improve the qualities of our wheats. He also spoke of the good work done by many of our farmers in this respect, and mentioned that in order to encourage the introduction of new wheats of improved character the Government would offer prizes of £100 for competition in different districts.

Owing to various causes some delay occurred in offering these prizes, but 18 months ago the conditions for the competition were arranged and advertised. These provided that the prizes should be for the "best wheat" respectively in districts (1) south of Adelaide, (2) the Lower North, and (3) the Upper North; that the wheats entered need not necessarily be new, improved strains of existing varieties being admitted to the competition; that competitors submit 10bush. of each sample offered for competition, accompanied by a written declaration to the effect that the grain is immediately and directly derived from wheat grown on their farms for at least three years in succession; that the competitor's samples be divided into five parcels of 2bush. each, which will be sown in 1909 on five farms typical of the district in which the wheats are entered for competition; that a committee—consisting of three members of the Advisory Board of Agriculture, the Principal of the Roseworthy Agricultural College, and the Departmental Professor of Agriculture—will watch the tests and report to the Minister, with recommendations as to awards.

In judging the wheats the following points were adopted for the guidance of the committee:—

Purity of seed supplied	5 per cent.
Yield	25 "
Resistance to red rust	20 "
Milling quality	15 "
Strength of straw	10 "
Retention of grain	10 "
General suitability to district.....	15 "

The Advisory Board of Agriculture appointed Messrs. A. Dawkins, J. Miller, and C. Willcox to act with Professors Angus and Perkins, and at the first meeting Mr. C. Willcox was appointed Chairman. At the request of the

committee the Minister appointed Mr. W. L. Summers as secretary, and to that gentleman was entrusted the general arrangements in connection with the competition.

The committee decided that for this competition the Upper North district should be that portion of the State north of a line drawn from Petersburg to Port Germein, while the Lower North extended southward to Adelaide and included the West Coast.

ENTRIES.

The following wheats were entered for the competition :—

Upper North.—Selected Dart's Imperial (Mr. J. Howard, Yongala), selected Federation (Mr. F. Coleman, Saddleworth), and the Western Australian Agricultural Department forwarded a sample of Alpha, to be tested with the others. The wheats were distributed among Messrs. J. Smith, Hawker ; J. McColl, Kingswood ; M. Corcoran, Hammond ; T. H. P. Tapscott, Walloway ; and A. Carmichael, Telowie.

Lower North.—Selected Federation (Mr. F. Coleman, Saddleworth), Richter's Eminence (Mr. W. Richter, Gawler), Flinders (Mr. E. G. Blesing, Bangor), Hardy's Elation (Mr. A. Hardy, Smoky Bay). Another Western Australian wheat, Crossbred 73, was included in this test for comparative purposes. The various wheats were grown by Messrs. A. Miell, Crystal Brook ; A. & J. Cousins, Bute ; G. C. Neville, Balaklava : S. F. Potter, Lipson ; and at the Roseworthy Agricultural College.

South of Adelaide.—Red Gamma and White Gamma (Mr. W. Champion Mills, Native Valley), selected Comeback (Mr. J. Frame, Mount Barker Springs), and Crossbred 53 represented the Western Australian Department of Agriculture. The wheats were placed in the hands of Messrs. A. D. Hair, Kanmantoo ; Koch Bros, Lameroo ; H. Milne, Bordertown ; M. Rankine, Strathalbyn ; and the officer in charge of the Kybybolite Experimental Farm.

Owing to the failure to observe the conditions of the competition the plots at Hawker were useless for the test, while at Kybybolite the excessive wet following the seeding destroyed the wheat. At Bute and Lipson the plots were also affected by excessive moisture.

RESULTS IN UPPER NORTH.

Prior to the commencement of the harvesting operations the plots in the Upper North were inspected by Professor Angus, who carefully examined the different wheats with a view to award the points for all except the yield

and milling quality. These were determined later, the latter by means of the mill in the possession of the Department of Agriculture.

Yields per Acre.

Variety.	Walloway.		Hammond.		Kingswood.		Telowie.		Average.
	Bus.	Lbs.	Bus.	Lbs.	Bus.	Lbs.	Bus.	Lbs.	
Dart's Imperial	15	12	18	10	17	57	26	8	19·21 $\frac{1}{2}$
Federation	16	49	22	40	21	38	24	34	21·25 $\frac{1}{2}$
Alpha	10	56	17	24	16	36	22	41	16·54 $\frac{1}{2}$

Milling Results.

Dart's Imperial—Color, bad ; strength, 39·6 ; nitrogen, 1·41 per cent.
 Federation—Color, good ; strength, 39·6 ; nitrogen, 1·54 per cent. Alpha—Color, good ; strength, 40 ; nitrogen, 1·43 per cent.

Points Awarded.

Variety.	Purity of Seed.	Yield.	Milling Quality.	Strength of Straw.	Retention of Grain.	Suitability to District.	Grand Total.
Maximum points	5	25	15	10	10	15	
Dart's Imperial	3·5	12·25	9	9·5	9·5	10·5	54·25
Federation	3·75	15·5	10	10	9·5	12	59·75
Alpha	4	10	11·5	3	8	4	40·5

It will be noted that Federation not only made the highest average yield, but also the highest total points.

THE LOWER NORTH.

The plots in the Lower North district were examined prior to the harvest by Mr. Summers, who awarded points for everything except milling quality and the yield.

Yields per Acre.

Variety.	Crystal Brook.		Bute.		Balaklava.		Roseworthy College.		Lipson.		Average.
	Bus.	Lbs.	Bus.	Lbs.	Bus.	Lbs.	Bus.	Lbs.	Bus.	Lbs.	
Federation	23	50	26	2	30	18	26	55	26	31	26·43 $\frac{1}{2}$
Crossbred 73	22	51 $\frac{1}{2}$	21	8	15	19	21	20	8	55 $\frac{1}{2}$	17·45 $\frac{3}{4}$
Richter's Eminence	19	27	18	25	16	0	28	56	20	21	20·37 $\frac{1}{2}$
Flinders	17	20	14	7	22	39	23	29	16	10 $\frac{1}{2}$	18·45
Hardy's Elation	18	8	15	32	18	4	21	40	18	6 $\frac{1}{2}$	18·18

Milling Results.

Federation—Color, fair; strength, 39; nitrogen, 1.82 per cent.; flour, 75.1 per cent. Crossbred 73—Color, strong, yellow excellent; strength, 40; nitrogen, 1.40 per cent.; flour, 71.7 per cent. Richter's Eminence—Color, good; strength, 39.6; nitrogen, 1.68; flour, 70.1 per cent. Flinders—Color, very good; strength, 43; nitrogen, 1.53 per cent.; flour, 71.6 per cent. Hardy's Elation—Color, very fair; strength, 38.8; nitrogen, 1.50 per cent.; flour, 68.9 per cent.

Points Awarded.

Variety.	Purity of Seed.	Yield.	Milling Quality.	Strength of Straw.	Retention of Grain.	Suitability to District.	Grand Total.
Maximum points	5	25	15	10	10	15	
Richter's Eminence	5.0	13.5	9.5	9.6	10.0	14.8	62.4
Hardy's Elation	4.6	11.2	8.0	9.0	10.0	14.6	56.6
Federation	3.5	19.5	10.0	10.0	9.5	15.0	67.5
Flinders	4.0	11.5	11.0	9.8	10.0	11.0	57.3
Crossbred 73	3.8	10.5	10.5	5.2	10.0	13.0	53.0

In this district again Federation occupies top place both in yield and total points.

SOUTH OF ADELAIDE.

All the plots in the district south of Adelaide were inspected by Mr. Summers and points were awarded as in the case of the Lower North.

Yields per Acre.

Variety.	Strathalbyn.	Kanmantoo.	Lamereo.	Bordertown.	Average.
	Bus. Lbs.	Bus. Lbs.	Bus. Lbs.	Bus. Lbs.	Bus. Lbs.
Red Gamma	32 4	21 35	21 40 $\frac{1}{4}$	20 14	23.53 $\frac{1}{4}$
White Gamma	28 38 $\frac{1}{2}$	22 30	24 33 $\frac{3}{4}$	20 36	24.4 $\frac{1}{2}$
Comeback	25 26 $\frac{1}{2}$	18 58 $\frac{1}{2}$	22 22	19 35	21.35 $\frac{1}{2}$
Crossbred 63	26 10	22 37	not grown	21 0	23.1 $\frac{1}{2}$

Milling Results.

Red Gamma—Color, fair; strength, 40; nitrogen, 1.49 per cent.; flour, 74.7 per cent. White Gamma—Color, strong yellow, fair; strength, 39.6; nitrogen, 1.41 per cent.; flour, 71.1 per cent. Comeback—Color, very fair; strength, 47.2; nitrogen, 1.51 per cent.; flour, 74 per cent. Crossbred 53—Color, good; strength, 46.2; nitrogen, 1.66 per cent.; flour, 75.6 per cent.

Points Awarded.

Variety.	Purity of Seed.	Yield.	Milling Quality.	Strength of Straw.	Retention of Grain.	Suitability to District.	Grand Total.
Maximum points	5	25	15	10	10	15	
Red Gamma	3·0	16·75	11·5	9·5	9·5	15·0	65·25
White Gamma	3·8	17·0	11·0	9·2	9·5	15·0	65·5
Special Comeback	3·5	14·5	13·0	7·2	7·0	13·7	58·9
Crossbred 53	4·5	16·0	13·5	9·0	9·5	14·5	67·0

In this district, while White Gamma occupies first position in regard to yield, Crossbred 53 takes first place in the total owing to it being of better milling quality and freer from foreign seeds.

ABSENCE OF RUST.

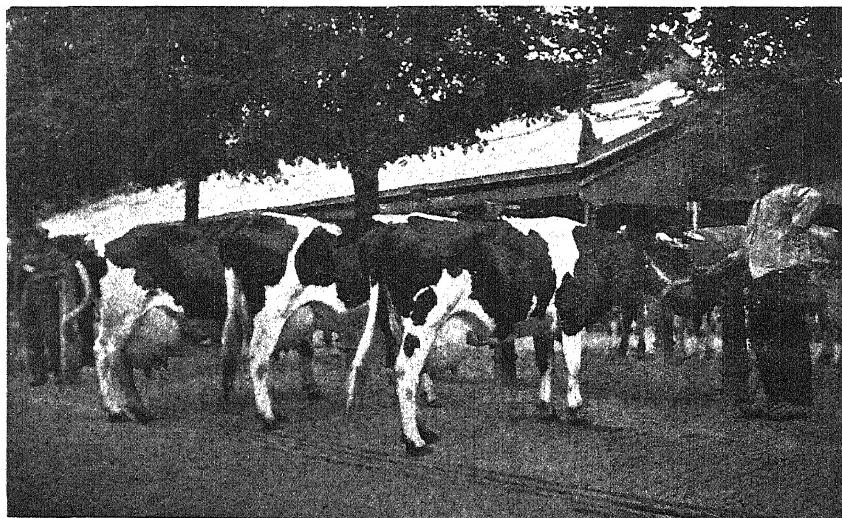
It will be noted that no points were awarded for resistance to rust. In none of the varieties was there any sign of the disease, and as the crops alongside, which included in many cases varieties known to be liable to rust, were also free from the trouble, there was no means of arriving at a definite judgment upon this aspect of the competition; consequently the committee considered it better not to allot points for rust resistance. The alternative would have been to give full points, while in another season the wheats might suffer from the disease, and so be discredited from the point of view of rust resistance.

COMMITTEE'S RESOLUTIONS.

The full reports furnished by Professor Angus and Mr. Summers were considered by the committee, which resolved—That the Federation wheat grown in the plots in the Upper North and Lower North, as shown by actual results, is not an improvement on an established variety, and is not therefore entitled to the prize; and, as this wheat beat the other wheat entered in these districts, the committee recommends that no award be made. That in respect to the South of Adelaide district, Crossbred 53 takes highest place; but this was sent by the Western Australian Department for comparison with our wheats, and is not an actual competitor. White Gamma has secured highest place in the competition, but in each locality some other wheat in more or less general use has beaten it in yield. Further, this wheat is not as clean as a new or selected wheat should be, and the committee is therefore of opinion that no prize should be paid. The committee would strongly recommend that the offer of prizes be renewed for competition five years hence to encourage growers to attempt to improve their wheats, and that the conditions governing the offer be amended. That, in view of the fact that no prizes are awarded, the Minister be recommended to pay to each competitor the value of his seed

supplied by them, viz., 10 bush. at 5s. per bushel. The committee, in recommending another competition in five years, desires to give those interested time to work up a supply of pure seed of improved types of wheat. In connection with their recommendation that no prize be awarded the members of the committee feel that the first clause in the conditions under which the prizes were offered, *i.e.*, "for the best wheat" for the respective districts, placed upon them the responsibility for deciding whether any of the wheat answered to that description.

Acting on the recommendations of the committee, the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) has decided that none of the wheats justifies the payment of the prize-money, but he has approved of each competitor being paid the full value of the grain supplied for competition. As the results indicate, with the exception of Crossbred 33 the wheats entered by the Western Australian Department of Agriculture proved distinctly unsatisfactory. Crossbred 53, however, developed in an exceedingly promising manner, and the magnificent grain exhibited at the Show evoked much favorable comment. Few (if any) of the other grains displayed appeared to better advantage, and with the high milling quality which distinguishes the wheat it is likely to receive further attention. Owing, however, to it being somewhat late in maturing it is not suitable for any but the cooler districts of the State.



FRIESIAN HERDBOOK COWS, HOLLAND.

ROSEWORTHY AGRICULTURAL COLLEGE.

Harvest Report, 1909.

(Continued from page 662 of March issue.)

PART II.—WHEAT HARVEST.

By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.

At the time of Professor Perkins's departure for Europe the wheat crop had only begun to reach the thresher, and he was therefore unable to complete the harvest report. A portion of the hay also was lying out in Nottle's and Grainger's, so that additional matter has had to be added to complete the hay returns, but, in order to preserve the general scheme of the report, this has been included in its proper relative position in Part I.

It is much to be regretted that Professor Perkins, who had opportunities of studying in detail the progress of each field and of carefully noting the effects of such an abnormally wet season, was precluded from finishing this account of the harvest. In taking up the story I have felt somewhat at a disadvantage from this point of view, but have endeavored to gather together all available particulars, and to interpret the data thus obtained in a way that is likely to prove of interest to farmers and the public generally. I have received valuable assistance from Mr. W. J. Spafford (Assistant Experimentalist) and Mr. J. P. Richardson (Farm Superintendent); indeed, it is only right to say that without their co-operation the section of the report for which I am responsible must have lacked much of the interest and detail with which it is furnished.

Since the prefatory remarks of Part I. were written there has been a noteworthy thunderstorm, which resulted in a downpour of 1.72in. The whole of this volume of water fell in about an hour on the afternoon of the 7th of January; the country was deluged and a considerable amount of damage was done to the crops. The grain crop in Nottle's suffered very severely in parts, and the value of the returns for comparative purposes was seriously upset. With the exception of this thunderstorm there was no rain recorded in the month of January.

WHEAT CROP.

The wheat crops for 1909 were sown in Dahlitz (No. 16), Nottle's (No. 5B) and the Permanent Experimental Field.

DAHLITZ.

This field was purchased for the College in 1899, and hitherto it has not given satisfactory returns. Its past history is given below—

1899....	Bare fallow	1905....	Oats (failure)
1900....	Wheat	1906....	Wheat
1901....	Bare fallow	1907....	Rape
1902....	Wheat and oats (failure)	1908....	Bare fallow
1903....	Barley	1909....	Wheat
1904....	Pease		

Portion of this field is a native pine sand ridge, whilst the lower end lies very cold and wet throughout. The land was fallowed very early, and subsequently worked down into a clean tilthy seed bed. Between the 22nd May and the 1st June it was sown to King's Red (selection 2) and King's White (selection 2); there were 36.71 acres of the first and 7.47 acres of the second variety. Graded seed was sown at the rate of 85lbs. with superphosphate at about 205lbs. per acre.

Owing to the continued heavy rains during July and the early part of August, amounting to over 8in., the low-lying portion of the paddock began to suffer from "wet feet" and to assume the sickly and unhealthy appearance characteristic of a drowned crop. In order to correct this it was top-dressed in the spring (August 18th and 21st) with a mixture of equal parts by weight of potassium muriate, and nitrate of soda. Of this stimulating mixture 1cwt. per acre was sown by hand, and its effect was speedily seen. The crop made a remarkable recovery; it received, as it were, a new lease of life, and retained its vigor during the remainder of the growing period. At harvest it was a fine-looking crop, but on the lower side showed a slight tendency to go down. Both varieties returned good yields of high quality grain, but, as shown below, there was a difference of over 4½ bush. per acre in favor of King's Red. A summary of the returns is appended:—

	Area. Acres.	Total Grain. Bush. Lbs.	Yield per Acre. Bush. Lbs.
King's Red (selection 2)	36·71	1,108 31	30 11
King's White (selection 2) ..	7·47	192 51	25 49
Total for whole field	44·18	1,301 22	29 27

FIELD No. 16.

A general account of the history and nature of this field has already been given in connection with the hay harvest. It should be observed, however, that during 1906-1908 it carried an average of over three and a half sheep to the acre for two years, and, further, that in 1908 the portion sown to white mustard was fed down with sheep in the spring. At the time of seeding, therefore, the soil was in a high state of fertility, but owing to the fallowing having been delayed the seed bed was not as clean as was desirable.

In addition to the numerous hand plots this field carried a main crop, consisting of King's Red and King's White varieties, a manurial test on drift sand, and finally a large number of variety plots, comprising different species, varieties, and selections of both rare and well-known types.

Main Crop.

We will treat of the main crop first. King's Red (selection 2) occupied 24·334 acres and King's White (selection 2) 2·346 acres. Seeding was begun on the 13th May and finished five days later, the work having been interrupted through rain; 85lbs. of graded seed and 195lbs. of superphosphate were used per acre. These wheats ripened very early, and, furthermore, they were grown on light land in high condition. They suffered severely in consequence from the blasts of wind that swept the Farm in October, whereas the same wheats grown under different conditions as to soil and soil fertility and at a different stage of maturity sustained practically no damage, although apparently no stronger in the straw. About one-half of the King's Red plot had to be cut for hay on account of this "blighting off," and the effect on the crop was also seen in the somewhat lean and pinched sample of grain obtained from the remainder. On the whole, however, as indicated in the appended summary, the yields are satisfactory; indeed, the average yield per acre for this quality of soil is remarkably high.

	Area. Acres.	Total Grain. Bush. Lbs.	Yield per Acre. Bush. Lbs.
King's Red (selection 2)	24·334	654 6	26 53
King's White (selection 2) ..	2·346	66 15	28 14
Total for main crop	26·680	720 21	26 59

Manurial Test on Drift Sand.

In No. 16 we have a typical piece of drift sand, that is to say, sand that has recently blown across from other parts of the field or elsewhere and accumulated

in a loose, drifting mass that is ill-suited to carry wheat successfully without special treatment. The paddock being in crop, an opportunity of testing the relative values of various manurial dressings on soil of this type arose, and the following particulars in regard to the work and the results obtained should be of interest. The variety used was King's Red (selection 2), and it was sown on the 13th of May at the rate of 85lbs. of graded seed per acre. The area was divided into three plots, all of which received 195lbs. of super. per acre at the time of seeding. Plots 1 and 2 received in addition 1cwt. each of nitrate of soda, whilst a similar amount of sulphate of potash was applied to plot 1 and of muriate of potash to plot 2. All the manures were sown in the autumn at seeding time. Plot No. 1 was undoubtedly the best crop from the start to the finish; it sprang away rapidly, made strong growth in the early spring, matured about November 20th, and, although a little on the "strawy" side for a grain crop, it yielded nearly 25bush. per acre—a very close approximation to the general Farm average for the season.

A remarkable and significant fact is that although the crop was right in the path of the withering north wind that wrought such havoc in the bulk plot, yet not a head of it appeared to suffer, and the line of "blight" could be clearly traced along the line of junction of the main plot and the drift-sand manurial test plot 1. Plot No. 3, which received superphosphate alone, and was, therefore, comparable to the King's Red of the bulk plot, was away on the other side of the hill, so that no importance attaches to its appearance in this connection. It certainly seems remarkable that the wheat sown on light land and manured in the orthodox way should so suffer from wind blight as to be ruined for grain, whilst the same variety sown alongside on loose, open, drift sand, but receiving in addition to the usual superphosphate 1cwt. each of nitrate of soda and sulphate of potash, should escape unharmed.

The second plot ripened at the same time as No. 1, and gave 2 $\frac{1}{4}$ bush. per acres less grain, whilst the central area (No. 3) was unsatisfactory in every way. On the latter plot the seed germinated fairly well, but grew up into a thin short plant, which ripened about four or five days later than the other plots. Viewing the three plots in the paddock, one would have anticipated a greater discrepancy in the yields than was revealed by the thresher. The yield per acre for plot 3 was over 7 $\frac{3}{4}$ bush., giving differences of 17bush. 3lbs. and 14bush. 48lbs. in favor of plots 1 and 2, respectively. With wheat at 3s. 9d. per bushel this amounts to a gross saving of £3 3s. 11d. per acre in the case of plot 1. The cost of purchasing and applying the extra 2cwt. of manure would come to 31s. or 32s. per acre, which leaves a net profit of like amount. It may be truly said that it is unfair to argue from a single year's test, more especially as the past season was particularly well suited to bring out the extreme values of such a test, but nevertheless the results obtained are so impressive that I have thought fit to deal with them at some length. At the same time the figures are not to be regarded as furnishing reliable data on which to base future calculations.

TABLE VI.—*Manure Tests on Drift Sand, Field No. 16. Variety—King's Red (selection 2).*

Plot.	Area. Acres.	Manures per Acre.	Yield per Acre. Bush. Lbs.	Net Return for Extra Manure— Wheat at 3s. 9d.
I.	1.082	195lbs. super. 1cwt. nitrate of soda 1cwt. sulphate of potash	24 53	32s. to 33s.
II.	1.117	195lbs. super. 1cwt. nitrate of soda 1cwt. muriate of potash	22 38	25s. to 26s.
III.	0.604	195lbs. super.	7 50	—

Variety Plots.

These plots were sown at the same time as the rest of the field, and were manured at the rate of 2cwt.s. of superphosphate per acre. The series comprises some 26 different wheats, and includes a number of hybrids. Naturally many of the yields are exceedingly low, for we are dealing with types that are yet to be acclimatised and that are frequently otherwise unsuitable to the district; some of the less common species are shy yielders even in their native homes. Unfortunately, the plots suffered more or less seriously from "takeall," particularly the soft wheat plots, as shown in the following table of estimates made by Mr. Spafford :—

Variety.	Percentage of Crop Lost.
	(Approx.)
Fan (selection 4)	15
Jonathan (selection 1)	" 20
Marshall's 3B (selection 2)	" 20
College Comeback (selection 2)	" 8
Marshall's 3A (selection 2)	" 8
Viking (selection 1)	" 4
Federation (selection 1)	" 20

The full details in respect of these variety plots are contained in the subjoined table :—

TABLE VII.—*Varieties, Field No. 16.*

Variety.	Area.	Seed per Acre.	Date Sown.	Date Germi-nated.	Date Flowered	Date Ripened.	Total Grain.	Grain per Acre.
	Acre.	Lbs.					Bush. Lb.	Bush. Lb.
White Starch Wheat .....	.026	85	Apr. 21	May 4	Oct. 24	Nov. 29	0 25	16 1
Black Starch Wheat .....	.026	85	" 21	" 5	" 30	Dec. 14	0 13	8 20
White Spelt .....	.026	85	" 21	" 4	Nov. 8	" 18	0 9	5 46
Engrain Double .....	.026	85	" 21	" 7	" 6	" 6	0 6	3 50
Triticum monococcum .....	.026	85	" 21	" 5	Dec. 6	Feb. 4	—	—
Polish .....	.026	85	" 21	" 3	Oct. 22	Dec. 2	0 12	7 40
Ble d'Australie .....	.026	72	" 21	" 3	" 30	" 19	0 16	10 14
Hybrid Massy .....	.026	72	" 21	" 3	Nov. 4	" 16	0 16	10 14
Hybrid Bon Fermier .....	.026	72	" 21	" 3	Oct. 30	" 11	0 18	11 32
Hybrid Dattel .....	.026	72	" 21	" 4	Nov. 8	" 12	0 9	5 46
Hybrid Briquet Jaune .....	.026	72	" 21	" 3	" 10	" 14	0 13	8 20
Hybrid Champlan .....	.026	72	" 21	" 3	" 29	" 9	0 19	12 10
Hybrid Lamed .....	.026	72	" 21	" 5	" 3	" 12	0 12	7 40
Hybrid Bordier .....	.026	72	" 21	" 4	" 4	" 11	0 17	10 54
Hybrid Grosse Tete .....	.026	72	" 21	" 3	" 10	" 11	0 16	10 14
Hybrid Trezor .....	.026	72	" 21	" 2	" 4	" 11	0 8	5 7
Marshall's No. 3A (selection 2)	.634	72	May 4	" 14	Oct. 25	Nov. 29	12 50	20 15
Viking (selection 1) .....	.056	85	" 4	" 14	" 7	" 24	1 10	20 50
Federation (selection 1) .....	.036	85	" 4	" 14	" 23	" 29	1 12	33 20
From Adjini C .....	.026	85	" 4	" 14	" 28	Dec. 7	0 28	17 57
Fan (selection 4) .....	.403	85	" 5	" 14	" 15	Nov. 25	5 18	13 9
Jonathan (selection 1) .....	.343	72	" 5	" 16	" 24	" 29	9 24	27 24
Marshall's No. 3B (selection 2)	.187	72	" 5	" 14	" 23	" 29	5 7	27 22
College Comeback (selection 2)	.275	85	" 5	" 14	" 8	" 22	5 18	19 16
Petatz Surprise .....	.865	72	" 5	" 14	" 9	" 24	7 9	8 16
Bearded Rieti .....	.179	85	" 26	June 8	Nov. 5	" 12	1 50	10 15

The total grain yield over the whole field (32.903 acres) is 830bush. 33lbs., which gives an average return per acre of 25bush. 15lbs., and, if we disregard all plots under half an acre, we have a total area of 30.982 acres, yielding 25bush. 44lbs. to the acre.

FIELD No. 5B.

This field forms part of the original College Farm. The soil is of a heavy, sticky nature, and sets remarkably hard on drying; it frequently holds water on the surface for months at a time. The following schedule gives a *précis* of the treatment of the paddock since 1897:—

1897.....	Bare fallow	1904.....	Wheat
1898	Wheat	1905.....	Pasture
1899.....	Wheat	1906.....	Bare fallow
1900.....	Bare fallow	1907.....	Wheat
1901.....	Wheat and oats	1908.....	Bare fallow
1902.....	Pasture	1908.....	Wheat
1903.....	Bare fallow		

Fallowing was begun sufficiently early for this class of land, and in November precaution was taken to apply a good ton of quicklime per acre. The lime was carted out, deposited in small heaps evenly over the field, and subsequently spread and harrowed in. It was most fortunate that this should have been done, as there was little doubt that but for the effect of the lime on the physical condition of the soil the crops would have utterly failed. Even in a season of normal rainfall there is considerable risk with soil of this type, but with over 23in. nothing but disaster could have ensued.

Fifty-five out of the 70 acres were sown with Gluyas (selection 2)—main crop—and the balance carried a number of different varieties of soft and flinty wheats as well as those competing for the Government prize in the Lower North district.

Main Crop.

Area, 54·962 acres. Some 10 or 11 acres were seeded on the 12th and 13th of May, but owing to the heavy rain the soil became too soggy, and drilling was not finished until the 21st of May. One hundred and ninety-five pounds of superphosphate and 92lbs. of clean graded seed were sown to the acre. Generally speaking, the season was not satisfactory for this paddock, and the crop hung fire for some time, but as the season advanced it recovered well, and towards ripening gave every promise of a 25-bush. yield. The actual yield, however, was barely 21bush., but the grain was of first-class quality. The total amount of grain harvested was 1,153bush. 31lbs., giving an average yield per acre of 20bush. 59lbs. When these figures are compared with those obtained on the lighter land in "Dahllitz" and the still sandier soil in No. 16 the influence of the season on the yield is well brought out.

Variety Plots.

In this series are included, first, the flinty or Durum wheats; second, the latest selections of approved varieties of soft wheats; third, the competition wheats. If we except the permanent experimental field, the highest yield per acre this year was given by a macaroni wheat called Mahmoudi. This variety yielded 36bush. 13lbs., but it belongs to a group that is, comparatively speaking, of little importance to farmers generally. The varieties of *Triticum Durum* have all done well this season, as compared with last year's results. This would go to show that, although they are regarded as useful varieties in regions that are too dry to grow soft wheats satisfactorily, they respond well when grown under better conditions as regards moisture.

Of the pedigreed College wheats no less than three have yielded over 30bush.; thus, King's Red (selection 4) gave 33bush. 41lbs.; Late Gluyas (selection 4), 33bush. 8lbs.; and Bearded Gluyas (selection 4), 30bush. 35lbs. Three others have given over 28bush. per acre, and only two fell below the general farm

average. Probably, if these selected varieties had been sown in one of the other wheat paddocks, where the soil is lighter and natural drainage more complete, these returns would have been still higher; but even now they constitute a fitting reward for the time and care bestowed upon them during the process of their evolution.

The competition wheats have all done fairly well with us, especially Richter's Eminence. However, as the committee in charge of this scheme will doubtless publish a full report in due course, I will not go further into detail. Suffice it to say that, with two exceptions, the competition wheats all fall below the average yield of the College Farm.

No useful purpose would be served by calculating the general average of the whole of the variety plots, but for the sake of farm statistics it is advisable to include the total grain produced over the entire field (1,555 bush. 1lb.) and the yield (22 bush. 9lbs. per acre). The amount of superphosphate used was the same as in the case of the bulk crop, namely, 195lbs. per acre. Complete details are appended in tabular form.

TABLE VIII.—*Varieties in Field No. 5B.*

Variety.	Area.	Seed per Acre.	Date Sown.	Date Germi-nated.	Date Flowered	Date Ripened	Total Grain	Grain per Acre.
	Acres.	Lbs.					Bush. lbs.	Bush. lbs.
Main Crop—								
Gluyas (selection 2) ..	54.962	—	—	—	—	—	1,153 31	20 59
Variety Plots—								
Khleefah .....	.851	85	May 6	May 15	Oct. 20	Nov. 30	20 9	23 41
Soory .....	.731	85	" 6	" 17	" 11	" 24	11 18	15 27
Hmeerah .....	.985	85	" 6	" 15	" 18	" 26	27 29	27 54
Ahweedjah .....	.985	85	" 6	" 16	" 22	" 29	27 59	28 25
Mahmoudi .....	.567	85	" 6	" 15	" 20	" 30	20 32	36 13
King's Red (selection 4)	.731	72	" 7	" 16	" 1	" 14	24 37	33 41
King's White (selec-tion 4) .....	.911	72	" 8	" 18	" 6	" 20	26 34	29 10
Late Gluyas (selection 4) .....	.761	72	" 8	" 18	" 19	" 28	25 13	33 8
College Eclipse (selec-tion 2) .....	.224	72	" 10	" 20	" 17	" 26	5 33	24 47
Carmichael's Eclipse (selection 2) .....	.343	72	" 10	" 20	" 18	" 26	7 50	22 50
Gluyas (selection 4) ..	.313	85	" 10	" 20	" 10	" 22	8 53	28 23
Bearded Gluyas (selec-tion 4) .....	.717	85	" 10	" 20	" 11	" 29	21 56	30 35
Lambda (selection 4) ..	.042	72	" 10	" 21	" 13	" 29	0 15	5 57
Competition Wheats—								
Crossbred 73	1.403	72	" 7	" 17	" 3	" 16	29 56	21 20
Richter's Eminence ..	1.418	72	" 7	" 17	" 14	" 22	41 1	28 56
Flinders	1.403	72	" 7	" 16	" 28	Dec. 9	32 57	23 29
Hardy's Elation	1.418	72	" 8	" 17	" 24	" 1	30 43	21 40
Federation	1.433	72	" 8	" 17	" 22	" 1	38 35	26 55

"NOTTLE'S."

The treatment accorded to this field since it became College property is set out in the report of the hay returns. The southern half was fallowed rather late, and was scarcely fine enough at seeding time. Generally speaking, the various wheats made good headway, but those on the flat suffered from excessive moisture rather badly. In January, whilst lying in the stock, many of

them suffered considerable damage from the thunderstorm previously referred to. In parts, the stooks were washed away by the flood waters; indeed, it is literally true that some of the sheaves became so embedded in mud and rubbish that picks had to be used to recover them. The wheats sown comprised a number of our own selections of different varieties and also a plot of Jonathan. Details in regard to sowing period, manures, and yields are given below:—

TABLE IX.—*Showing Wheat Returns from "Nottle's."*

Variety.	Area.	Date Sown.	Seed per Acre.	Super-phosphate per Acre.	Total Yield.	Yield per Acre.
Gluyas (selection 2)	4·478	May 27	90	1·5	84 56	18 58
Gluyas (selection 1)	11·604	" 29	90	195	286 49	24 43
Bearded Gluyas (selection 1)	4·356	June 6	90	195	101 53	23 23
Bearded Gluyas (selection 3)	7·980	May 29	90	195	131 57	16 32
Bearded Gluyas (selection 1).....	11·084	{ " 28 to 29	90	195	206 15	18 36
King's Red (selection 3)	23·089	{ May 27 to 28	90	195	485 0	21 0
Gluyas (selection 3)	7·237	{ May 26 to 27	92	195	186 50	25 49
King's White (selection 3).....	16·940	{ May 25 to 26	90	195	445 13	26 17
Late Gluyas (selection 3)	3·081	May 11	85	236	55 2	17 52
College Eclipse (selection 1)	1·419	" 11	90	236	23 32	16 35
Carmichael's Eclipse (selection 1) ..	1·690	" 10	92	236	28 15	16 43
Marshall's No. 3B (selection 1)	1·708	" 10	70	236	30 36	17 55
College Comeback (selection 1) .....	.852	" 10	70	236	11 48	13 51
Marshall's No. 3A (selection 1)	2·079	" 10	78	236	36 50	17 43
Jonathan	19 072	{ Apr. 30 to May 3	90	236	334 36	17 33

There are several results included in the above synopsis that require explanation. In the first instance it should be pointed out that about $4\frac{3}{4}$ acres of King's White (third selection) were sown on May 11th, and received 236lbs. of superphosphate. It will be observed that the first selection of Gluyas has given nearly 6bush. to the acre more than the second selection, but this is only an apparent anomaly, as the longer pedigree wheat was seriously affected with "takeall," whilst at least one-third of the first selection chanced to be sown on a block that carried peas only four years ago. The margin of the pea plot was clearly shown by increased growth and tillering right up to harvest time.

A similar discrepancy arises in connection with Bearded Gluyas. The first plot of No. 1 selection yielded 23bush. 23lbs. and the second plot 18bush. 36lbs., whilst the later grade (selection 3) gave only 16bush. 32lbs. This can probably be explained on the following grounds:—The first plot of selection 1 was entirely on the block that carried peas, and, furthermore, was all threshed; the second plot of selection 1 was badly flooded in January; indeed, it suffered more than any other variety; the third selection plot was stripped, and badly stripped at that. At any time Bearded Gluyas is better threshed owing to the way the head hangs over, but in this instance the loss was unusually heavy on account of the employment of inexpert labor. None of the third selection reaped the benefit of the pea stubble. Both King's Red (selection 3) and Gluyas (selection 3) were reduced in yield on account of the flood waters, and Jonathan was seriously affected with the growth of rubbish. Late Gluyas

(selection 3) has given rather a disappointing return, but it lodged badly in parts, and, moreover, it was stripped—a method of harvesting which does not as a rule secure such high returns as binding and threshing. It should be remembered that selection 4 of Late Gluyas, in No. 5B, yielded over 33bush per acre. The total yield for the paddock was 24·49bush. 32lbs. of grain, giving an average per acre of 21bush. 59·7lbs. The total acreage under wheat in this paddock was 116·669 acres.

YIELDS OF THE MORE IMPORTANT VARIETIES.

We have now arrived at a stage in the work of seed selection and improvement at the College when we are in a position to put the whole of the grain produced on the market as seed wheat, and it therefore seems fitting under these circumstances to include in this report a brief summary giving the average returns per acre for the past few years of some of the more important varieties that have been offered for sale. These figures, however, are not to be taken as indicative of the relative merits of these wheats, as the yield is only one of a very large number of factors involved in the determination of quality or character. As far as the figures are available they have been embodied in the following table of yields. It will be observed that prior to 1907 King's Early was sown as a single variety, but subsequently the Red and White selections were kept distinct.

TABLE X.

	1909.	1908.	1907.	1906.	1905.	1904.
Rainfall (inches)	23·05	17·74	15·05	19·72	16·71	14·70
Varieties.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Gluyas	21·98	23·46	22·77	12·99	23·64	20·71
Late Gluyas	20·96	23·36	—	—	—	—
Bearded Gluyas	19·14	22·88	30·82	—	—	—
King's Red	26·73	25·58	32·10	} 16·01	23·08	20·07
King's White	26·25	27·51	33·17		—	—
Jonathan	18·18	16·38	21·75	33·63	19·83	14·17
Federation	26·91	10·55	18·37	—	—	—
Fan	13·15	15·31	14·98	6·54	—	18·56
College Eclipse	17·73	23·23	—	—	—	—
Carmichael's Eclipse	17·77	21·75	16·03	26·10	19·45	17·89
College Comeback	15·03	19·81	11·27	17·93	13·77	15·89
Marshall's 3A	18·32	21·41	—	—	—	—
Marshall's 3B	18·79	20·20	—	—	—	—

GENERAL WHEAT AVERAGE.

No reference has been made in this report to the wheat grown in the Permanent Experimental Field, as this will be dealt with in a separate article later on, but the final returns should be considered in connection with the general wheat average for the season. The acreage under wheat on the above field this year was 65·095 acres, and the total quantity of grain harvested

2,105 bush. 41lbs., giving an average yield per acre of .32bush. 21lbs. A matter that admits of some argument is the inclusion or omission of the very small hand and variety plots, amounting in some cases to areas of less than one-fortieth of an acre. In one sense it seems reasonable to include all wheat grown as crop on the farm; yet, on the other hand, in the case of very small plots it is impossible to exclude the "fallow effect" of the numerous divisional lines and headlands, or the innumerable slight errors of observation that are inevitable, and which, when multiplied to express the result in acre yields, are apt to give false notions with regard to the productiveness and relative merit of the different varieties. For the purpose of this report I have determined to exclude all plots covering less than half an acre of land, and although this only results in a difference of 3lbs. per acre in the seasonal yield, yet it will appeal to practical men, inasmuch as it reduces the possibility of error to a minimum. The general average for the whole farm works out at 25bush. 5lbs., and if we include the smallest plots it is 25bush. 2lbs. The total acreage under wheat is 329·045 acres, made up as follows:—Permanent Experimental Field, 65·095 acres; small plots (under half acre), .576 acres; field crops, 263·374 acres. The total yield amounts in all to 8,239bush. 19lbs., and of this 3bush. 44lbs. was harvested from the small plots.

This high average is undoubtedly due in some measure to the favorableness of the season, but on the other hand there were several factors operating against this beneficent influence. For instance, one of the paddocks chosen was a particularly heavy one, subject to water-logging; again "takeall" in some of its many forms did considerable damage; rough weather sent several plots right down; hot winds blighted off a good portion of the best crop, and checked grain development in the remainder; and, finally, the January flood considerably depreciated the return from "Nottle's." The credit account is thus to a considerable extent balanced, especially when we take into our calculations the increased returns attributable directly to the practice of using high-grade seed. From the following summary it will be seen that this year's average is the highest yet obtained, and I am sure that all who follow the progress of the College will agree that by their assiduous and untiring efforts towards this end Professor Perkins and his staff have well deserved success.

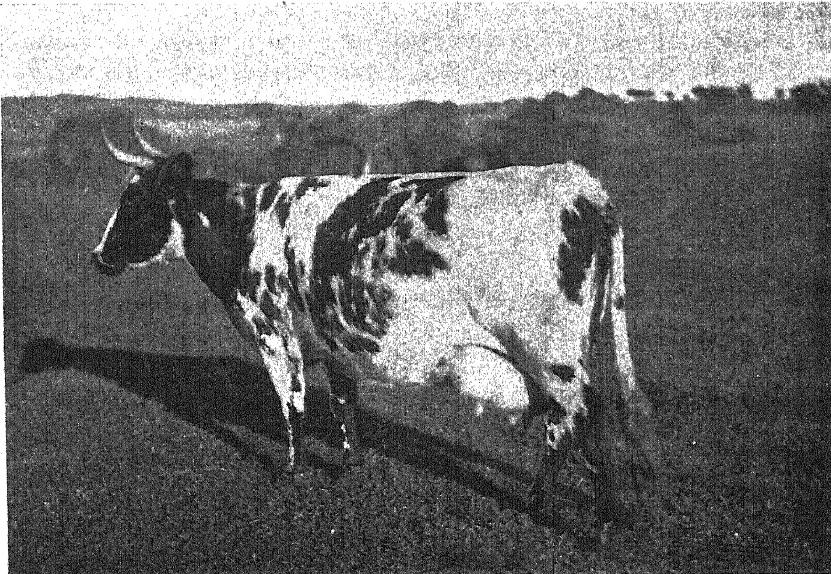
TABLE XI.—*Showing Average Yields of Wheat on College Farm from 1904 to 1909.*

Year.	Rainfall.	Area under Wheat.	Average Yield per Acre.
1904	Inches. 14·70	Acres. 330·00	Bush. lbs. 18 3
1905	16·71	212·00	24 11
1906	19·72	318·00	14 30
1907	15·06	178·00	13 20
1908	17·74	258·52	22 14
1909	23·05	328·47	25 5

SUMMARY.

To one who has recently returned to this State after an absence of eleven years these yields are eloquent of the advantages to be derived from the continuous and persistent adherence to thorough and seasonable cultivation of the land, rational manuring as dictated by an uninterrupted series of experiments,

and the adoption of an organised system for the raising of pedigreed samples of clean graded seed. When it is remembered that at the time the College site was chosen particular care was taken to select inferior land in order to submit scientific or rational farming to as crucial a test as possible, the raising of individual crops going between 30bush. and 34bush. per acre and the obtaining of a general farm average of over 25bush. are achievements which should stimulate and encourage those who are responsible in the main for the good work that has been accomplished. This has been a record year, as it is the first occasion on which the coveted average of 25bush. has been obtained, but in view of the influence of the culling and grading of wheat on the yield I am inclined to think that we have not yet reached our high-water mark. However, it is not for me to prognosticate; all I desire to say in conclusion is that we shall continue along the lines indicated herein, and do all in our power to command still further success. A tribute of praise is due to the students for the grit they have shown throughout the various stages of a protracted and tedious harvest.



"BLUE RIBBON OF TURRETFIELD."

ROSEWORTHY AGRICULTURAL COLLEGE.

Distribution of Diplomas and Prizes.

On Wednesday, March 23rd, a large number of the friends of the students and of Roseworthy Agricultural College assembled in the main hall of the institution to witness the awarding of the diplomas and honors won during the year. The Hon. T. Pascoe (Minister of Agriculture) presided, and was supported by Messrs. J. W. Sandford (chairman), J. Miller, T. N. Hardy, A. M. Dawkins, and W. L. Summers (Secretary of the Advisory Board of Agriculture). After a few opening remarks the Minister called upon the Acting Principal (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.) to read the annual report. This was as follows :—

Mr. Minister, ladies, and gentlemen—It is my pleasing duty to extend a hearty welcome to those who have demonstrated their interest in the institution by attending here to-day. Doubtless the exigencies of the period have deterred many others equally welcome from being present with us. But though absent in person, we feel assured they are with us in mind and spirit. It is, I believe, the first time since Professor Perkins joined the staff nearly 20 years ago that he has been absent on the occasion of the annual distribution of diplomas and prizes at the Roseworthy College. And it must be gratifying to him to realise throughout his tour that the present staff and students anticipate with pleasure his return to the institution for which he has done so much. Before passing on to consider the details of the year's work I would like to point out clearly my views on the value of this college to the State of South Australia. Having had practical experience of the educational methods employed in the study of agriculture and the associated subjects in Great Britain, Australia, and New Zealand, I feel qualified to pass judgment on the merits of our own college, and to compare it with similar institutions in other parts. The solid foundation of hard, honest work on which the reputation of this establishment has been built up was laid down in the times of Professors Custance and Lowrie, and there is no doubt that the strenuous and, in a large measure, successful efforts of those two pioneers to disabuse the public mind of its indefensible antipathy to the college paved the way for the grand work which has since been accomplished. Like most institutions of its kind the Roseworthy College has passed through some troublous times ; but I am

in a position to know that in this respect it has a record that will compare very favorably with that of any other college in Australasia. For some time the place was relegated to the gloomy depths of public disfavor, and consequently its influence in the State was very much restricted ; but of late years it may be said to have entered upon the halcyon days of its existence, and to have taken up its proper position in the vanguard of agricultural progress, not only in South Australia, but, indeed, throughout the Commonwealth.

The rapid development of public esteem has been due to several cogent causes, to which I will now briefly refer. In the first place, Professor Perkins, by his earnest and assiduous efforts to render the college useful as an experimental centre and as a reliable source of high-grade seed, has commanded the attention of practical men. It is not generally recognised in South Australia that at this college we have the first systematically arranged, permanent, experimental field in Australasia. Furthermore, the scheme of investigational work is now being extended, and it is doubtful if any similar institution in any of the federated States is to-day carrying on researches of such intrinsic value to the districts in which they are located as is the Roseworthy Agricultural College. Again, the more liberal attitude of the Government has materially assisted in the development of the institution. At one time the operations on the farm and the activities of the college staff were seriously hampered by the leanness of the Government grant ; but with the advent of more prosperous seasons this cause for complaint has practically been removed. It has thus been rendered possible to work the farm to better advantage and to provide more complete courses of instruction in the rural sciences. The throwing open of the broad acres for selection in districts of limited rainfall has aroused all sections of the public to the advantages to be derived from a closer study of soil and plant problems than has hitherto been considered necessary. The salutary influence of the seasons has also contributed to the success of the institution, and thereby assisted in the upbuilding of the reputation which the college now enjoys.

The outstanding feature of the Roseworthy College course is the thoroughness with which the curriculum, as set out in the prospectus, is adhered to. We read of gigantic institutions elsewhere carrying hundreds of students, and offering instruction in multitudinous subjects, bearing more or less on agricultural science. But when we come to inquire as to the amount of land that is cultivated per student we find that it is quite impossible for the lads to obtain the necessary training in practical farm work. On some of the British agricultural farms the work is done almost entirely by paid hands, the students being merely instructed in the theory of practice instead of being taught to wrestle with the problems of the farm. On looking over the year's work at Roseworthy I find that we had in all 516 acres under crop, 635 acres under fallow, and about 80 acres in vineyard and orchard. This gives a total of 1,231 acres under cultivation. Calculating on a basis of 48 students per

annum (which was the average number on the roll during the last year) this area will provide a trifle over 25 acres per student. Personally, I do not think any college can be expected to turn out men with practical experience as well as scientific knowledge unless an area of at least 20 acres per student be brought under cultivation each year; and yet there are institutions with several times as many students on the roll that cultivate still smaller areas than are worked on this farm. With regard to the farm operations for the year we have reason to feel pleased, inasmuch as the average wheat return was in advance of all previous records, being a few pounds over 25bush. per acre for the whole farm. The college seed wheat has been eagerly sought after by farmers from far and near; in fact, even with the new double grader at work it will tax our ingenuities to satisfy all the demands by the middle of April. Some highly satisfactory returns were obtained from the seed distributed last autumn. No less than 120 farmers were then supplied, and from the reports which they have since submitted it is seen that, except where the crop was interfered with by disease, climatic conditions, or an overgrowth of weeds, the yields ranged from 15bush. to 44bush. per acre.

The college roll-book shows the number of students in attendance during the year 1909-10 to have been 52, but the average number in residence at any one period was about 48. Actuated by desire to ascertain to what extent the farmers of this State were taking advantage of the course of instruction provided at the Agricultural College, I made a close scrutiny of the roll, and classified the students according to the occupations of their parents. The results obtained, I regret to say, cannot be regarded as other than a reproach on the farming community of this State. New South Wales, Victoria, and Western Australia, taken collectively, are represented on the college roll to an equal extent with the South Australian farmers. The great bulk, however, of those in attendance come either from the city or from rural homes that have no direct connection with the land. I am aware that practically the whole of the present students will eventually settle on farms of their own, but that in no way detracts from the deplorable apathy of the farmers in a matter that directly concerns the future of their children. In times of small yields and lean prices there was a tissue of excuse for the struggling farmer, who felt compelled to retain his sons' services in the family interest; but surely to-day no one would dream of employing an argument so chimerical to support the continuance of such a system. That the farmers themselves recognise the good value of the work carried on here is evidenced by their regular attendance in increasing numbers on Farmers' Day, by the stream of inquiries with which they favor us, and by the keen interest they evince in all reports emanating from the college. It, therefore, seems to me that in the matter of their sons' education they are either wofully indifferent or thoughtlessly selfish. The question does not directly concern me, as my position here is of a temporary nature; but as a South Australian, and as one

who is desirous of seeing the productive capacity of the State steadily increase and the rate of agricultural progress maintained, I sincerely trust the time is at hand when the farmers' sons of South Australia will be allowed to come into the heritage which the Government has so fittingly provided for them.

Let us now consider the diploma results for 1909-10. Seven students sat for the final examinations. Three of them have won a diploma of the first class, and four have secured second class diplomas. Although the record percentage obtained by Mr. Birks last year has not been attained to by any member of the present class, yet, taken as a body, the results obtained by the diploma students of this year are of a higher order than have been recorded since the college was founded. Not only has every member of the senior class secured his diploma, but, further, they have won them with distinction, and have gained the splendid class average of 75.9 per cent. Although Mr. Cook has won the gold medal, it is only fair to point out that he is only two marks ahead of Mr. Wells in a total of over 2,000. Mr. Cook has gained 87.55 per cent., and Mr. Wells 87.46 per cent. of the diploma total. In the second year N. S. Fotheringham becomes the silver medallist with 86.8 per cent., and in the first year G. C. Love comes top with 91.5 per cent. In concluding this report, I desire, on behalf of the staff and myself, to congratulate those who have been successful in winning the diploma of the college, and also the prizewinners in the junior classes. In saying farewell to our senior students we naturally regret the severance of those ties of good fellowship that have sprung up through close association during a period of years. Wherever they go and in whatever walks of life they may be thrown, we wish them all successful careers. To those who are returning we would express a wish for a bright and enjoyable holiday, and we trust that they will reassemble well equipped to undertake the new responsibilities that their promotion entails.

THIRD YEAR STUDENT, 1910, DIPLOMA.

ORDER OF MERIT.

First Class.

1. Leonard John Cook, with honors in chemistry, surveying, bookkeeping, dairying, and aviculture.
2. Geoffrey Erskine Wells, with honors in agriculture, veterinary science, chemistry, book-keeping, viticulture, dairying, and aviculture.
3. Frank Rivington Sangster, with honors in aviculture.

Second Class.

4. George William Linnett
5. Max Otte Weste, with honors in wool-classing, dairying, and aviculture.
6. Percival Rumball.
7. Thomas Roy Moten.

PRIZE LIST.

Third Year.

1. Gold medal, presented by the Royal Agricultural and Horticultural Society, highest aggregate in all diploma subjects—Leonard John Cook.
2. College second prize—Geoffrey Erskine Wells.
3. Old students' cup, presented by the Old Students' Association, highest aggregate in agriculture and veterinary science—Geoffrey Erskine Wells.
4. Special prize, presented by members of the Advisory Board of Agriculture, highest aggregate all practical examinations—Geoffrey Erskine Wells.
5. Special prize, best outside work, presented by Mr. W. J. Colebatch—Leonard John Cook.
6. Viticulture and wine-making, presented by Mr. H. E. Laffer—Geoffrey Erskine Wells.

Second Year.

1. Silver medal, presented by Mr. W. J. Colebatch, for highest aggregate in all subjects—Norman Stewart Fotheringham.
2. College second prize—Ivan Sinclair Young.
3. Special prize, presented by members of the Advisory Board of Agriculture, highest aggregate in all practical examinations—Norman Stewart Fotheringham.
4. Viticultural prize, presented by H. Buring, Esq.—Norman Stewart Fotheringham.
5. Special prize, presented by J. C. Genders, Esq., for best outside work—Rupert M. Wright.

First Year.

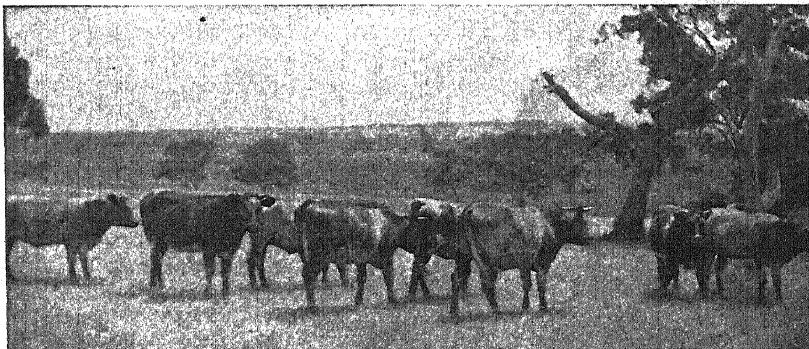
1. Silver medal, presented by A. L. Brunkhorst, Esq., highest aggregate in all subjects—George Clarke Love.
2. College second prize—Harold Snow.
3. Agricultural and farm dairies, presented by Mr. W. J. Colebatch—George Clarke Love.
4. Bookkeeping prize, presented by H. C. Pritchard—Harold Snow.
5. English prize—George Clarke Love.
6. College prize, for best outside work—Herbert Solly and Lewis Frederick Wilkinson, equal.

At the conclusion of the distribution of prizes by Mrs. Pascoe, the Minister delivered a short address. He referred to the good work that had been done by the college as an educational institute, from which valuable information was disseminated through the medium of the press, and to an immeasurable extent through its old students who had settled on the land. He also emphasized the importance of the work which had been carried out by the college in the direction of raising for distribution

among farmers seed wheat true to type and of first-class quality. He had been impressed with the high estimation in which the college was held in the other States, and instanced a case where a large landholder in Western Australia had recently secured the services of two Roseworthy graduates to undertake the management of his property. He also made special reference to the generosity of the members of the Advisory Board of Agriculture in providing prizes for practical work in the second and third year classes.

Messrs. Sandford and Miller, of the Advisory Board, expressed their appreciation of the college and the assistance it was rendering to the farmers of this State.

On behalf of the college the Principal thanked Mrs. Pascoe for her kindness in distributing the honors, and expressed gratitude to the Minister for his attendance, and to those who had presented prizes to the institution.



IMPORTED FRENCH WHEATS.

BY W. L. SUMMERS.

A little over twelve months ago numerous paragraphs of a laudatory character concerning some new wheats raised in France but grown in England were republished from English papers. At the suggestion of the Principal of Roseworthy Agricultural College, the Agent-General was instructed to obtain seed of the best of these wheats for trial in South Australia. Acting under these instructions, the Agent-General forwarded 12bush. each of Sensation, Treasure, and Red Marvel, and 4bush. of White Marvel. The seedsman's catalogue describes these wheats as follows :—

Sensation.—The earliest wheat in cultivation, compact ear, large grain, short stiff straw, excellent cropper, has beaten in yield all other French and English wheats grown in France.

Red Marvel.—Very early, long ear, large plump grain, long strong straw, heavy cropper. The largest grained red wheat in cultivation.

White Marvel.—Early, exceptionally long ear, grain very large and round. The best white wheat for milling purposes, and the largest white-grained wheat in cultivation.

Treasure.—Very early, long thick square head, long strong grain, rich in gluten, heavy cropper, straw of medium length and strong.

Recent English journals continue to speak highly of these wheats. Sensation is reported by the Principal of the Norfolk Experimental Station to have done best of all varieties grown in the district. One grower threshed 64bush. per acre from an 8-acre paddock, and another 56bush. per acre from 11 acres. Red Marvel and Treasure are credited with equally high returns.

Under the instructions of the Minister of Agriculture, arrangements were made by the Secretary of the Advisory Board of Agriculture for these wheats to be grown in the southern parts of the State, where it was considered they would do best. The wheats were accordingly entrusted to Messrs. W. G. Mills, Native Valley; A. D. Hair, Kanmantoo; E. R. Eime, Lameroo; H. Milne, Bordertown; D. Adamson, Penola; A. Sassanowsky, Mount Gambier; J. Frame, Mount Barker Springs; H. A. Giles, Mount Pleasant; C. J. Whillas, Port Lincoln; T. Pengilly, Aldinga. The Kybybolite Experiment Farm also received some of each variety for trial.

The results of these tests have been very disappointing. Germination was in most cases indifferent, and the excessive wet winter destroyed a large proportion of the plants. At Kybybolite, Port Lincoln, Aldinga, Penola, and Mount Gambier the plots were total failures. At Penola, Mount Barker Springs, Port Lincoln, Mount Pleasant, and Bordertown the crops were too thin to form any idea of the probable yield per acre. At Lameroo the crop was badly blighted by hot winds. The most satisfactory results were obtained at Native Valley and Kanmantoo. Instead of being very early, these wheats proved much later than our early mid-season varieties. They stool fairly well, but keep on the ground until the warm weather sets in, when growth is very rapid. This fact

probably accounts for their lateness compared with our own early wheats, which make most of their growth before the warm weather sets in. The wheats have every appearance of making good hay wheats, being of nice color, nearly solid in the straw, fairly heavy, and with plenty of flag. The grain on the whole is darker than local wheats. So far as it is possible to judge from one year's test, the plants are very liable to lose their grain when ripe. Arrangements will be made for a further trial next season of each variety.

Mr. W. G. Mills, of Native Valley, reports that Sensation yielded 10 $\frac{1}{2}$ bush. per acre and Treasure 11 $\frac{1}{2}$ bush. In view of the fact that there was only half a crop, owing to excessive moisture and takeall, these returns are satisfactory. The grain is an improvement on the seed supplied, but lacks the brightness and weight of the local wheats. Many of the heads of both varieties were very large.

From a very thin crop Mr. H. Milne, of Bordertown, harvested 7 bush. per acre of Treasure, 8 $\frac{1}{2}$ bush. of White Marvel, and 5 $\frac{1}{2}$ bush. of Red Marvel per acre. He states that the wheat weighed well, the bags weighing 192lbs. to 208lb. each.

Mr. A. D. Hair, of Kanmantoo, reports Red Marvel yielded 12 $\frac{1}{2}$ bush. per acre, the wheat being of slow growth until it heads, when it grows very rapidly. The plant is always a very dark green and stands well. The grain, though a little pinched this year, was tested by the local agent to weigh 65lbs. per bushel.

Mr. D. Adamson, of Penola, advises that the wheat was sown rather late, and as very wet weather succeeded the sowing germination was exceedingly poor. Treasure was a complete failure, but White Marvel did fairly well under the circumstances, and yielded about 15bush. per acre. The crop was caught by hot winds when coming into head, and the sample is somewhat pinched.

Mr. F. Coleman, of Tuela, Saddleworth, who received a small quantity of each of these wheats, reports that they were sown in somewhat sandy soil. They all suffered from excessive moisture in July and August, while the hot spells during October and November did a lot of damage, all of the wheats being more or less blighted. In some instances the top half of the head was completely spoiled. White Marvel yielded at the rate of 33bush. 57lbs. Red Marvel, 26bush. 2lbs., and Sensation, 22bush. 55lbs. per acre.

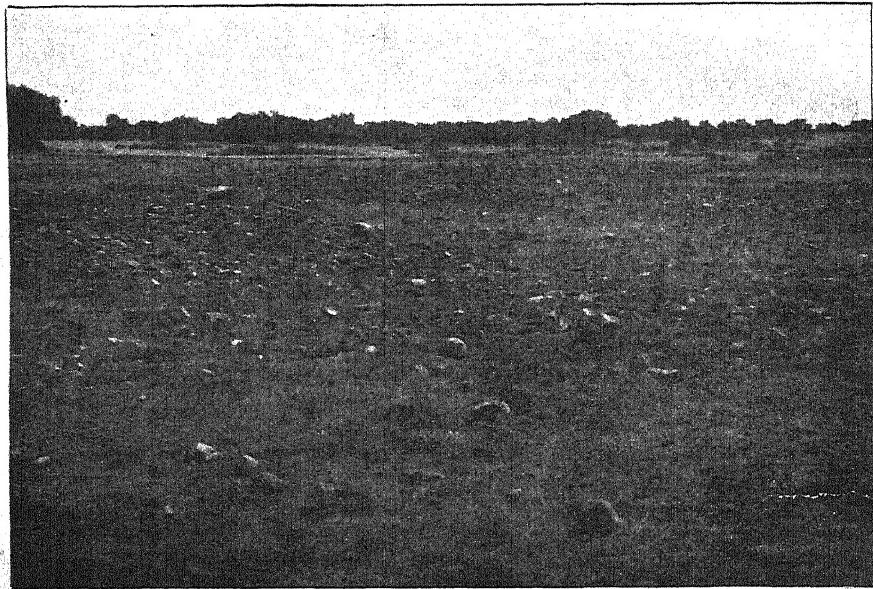
Mr. J. Frame, of Mount Barker Springs, reports that seed was sown on May 29th on land that had previously carried a pea crop. Only about 75 per cent. of the seed germinated, and on account of the excessive wet many of the plants died. At harvest fully two-thirds of the White Marvel had failed, and the yield from the balance was 9bush. 16lbs., of which 28lbs. consisted of tailings. Of Red Marvel the crop was damaged to the extent of three-fourths, and the yield was 6bush. 20lbs., of which 20lbs. were screenings. The grain of each is good, the White Marvel being the better.



TRIAL OF STONE-GATHERING MACHINES.

By W. L. SUMMERS.

In April, 1888, Mr. R. Caldwell, in writing to the Hon. Commissioner of Crown Lands, pointed out the "necessity of a machine being provided for the better assistance of the farmer on our rougher lands for gathering stones and stumps lying loosely on the surface, and thus materially reducing the cost of production," and he suggested that the Government should offer a bonus of £100 for the invention of such. This proposition met with the



Portion of Field on which 1910 Trial was Held.

approval of the then Commissioner, the Hon. Jenkin Coles, and on his recommendation the amount was placed on the estimates, the principal conditions required of the machine being :—

1. That it should be capable of gathering from the surface all loose stones or stumps of 1lb. to 56lbs. in weight.
2. The appliances to be attachable to an ordinary tip-dray, or to have a tip receptacle capable of carrying not less than 20cwts. of stones attached.
3. To clear not less than 4ft. 6in. in width at one operation; draught not to exceed that of three ordinary farm horses.
4. To be of reasonable cost, and of strong construction.

A large number of inventors sought for fuller information concerning the requirements of the machine, and several intimated their intention of competing at the first trial, which was held at Roseworthy College Farm on September 14th, 1889. Only one implement was, however, sent to the College, and the judges, in reporting on the trial said, this implement had a marked tendency to go too deep into the soil, and appeared to be altogether too light for the work expected of it. On the recommendation of the judges, a further trial was arranged for, and the conditions were altered to provide that the machine would only be required to lift stones of not less than 2lbs.



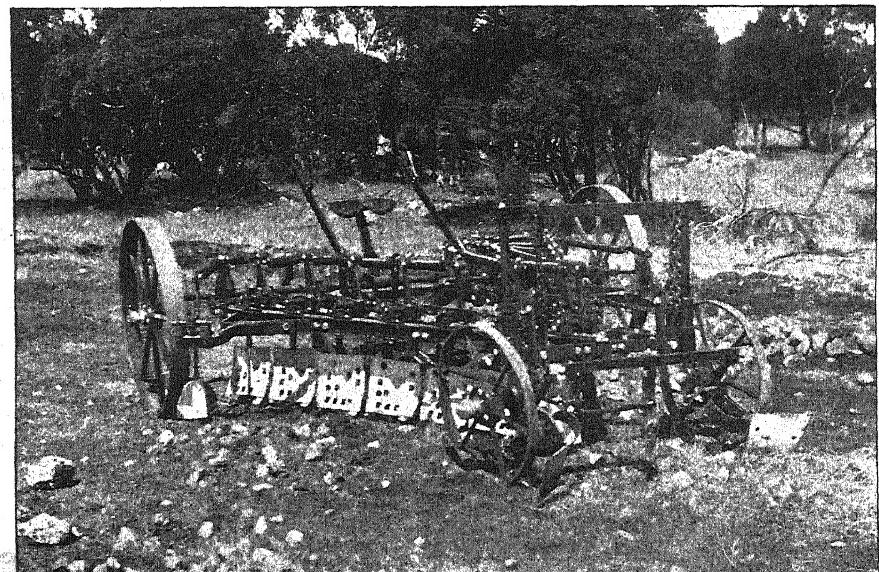
Field showing Stones put in Rows by Messrs. J. & R. Forgans' Machine.

in weight, and not less than 4in. across their longest axis. A second trial was accordingly advertised, and £150 made available for prizes. The trial was arranged for March 27th, 1890, on the farm of Mr. Faulkner, near Stansbury. This trial was very much a repetition of the first. A number of inventors promised to put their machines to the test, but only one appeared on the field, but this proved a failure.

Judging by more recent experience, the condition that the machines were to gather stones and stumps up to 56lbs. in weight, elevate them into a receptacle capable of holding 20cwts., and clear 4ft. 6in. in width at one operation-

with a draught not to exceed that of three ordinary farm horses, was undoubtedly too severe. In an article in the July, 1906, issue of this *Journal* the writer remarked—It was now recognised that a machine to gather the stones together into rows in the field would be a great help to those engaged in the cultivation of stony land; and that, when one considered the improvements effected by our machinists in agricultural implements, it was not unreasonable to expect that if sufficient inducement were offered an effective stone-gatherer would be invented.

The matter was taken up by the Advisory Board of Agriculture, and on its recommendation the Government reoffered the bonus of £100, and altered the conditions to permit of the stones being put together into rows, and

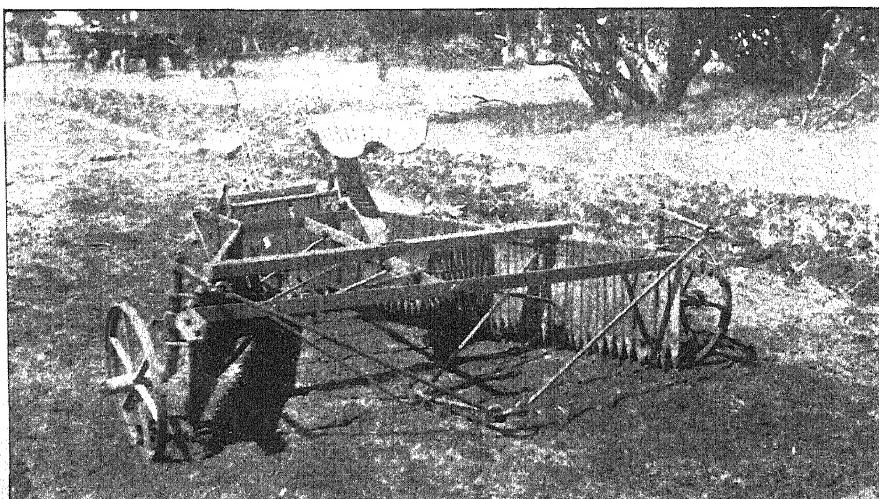


Winning Machine, entered by Messrs. J. & R. Forgan, of Port Pirie.

making 28lbs. the maximum weight of stones to be shifted. A further trial was held at Paskeville in February, 1908, at which four machines competed. All of these were designed to elevate the stones into a receptacle, but none of them were at all successful. In September, 1909, another trial was held at Paskeville, when five machines competed, two being designed to gather the stones into heaps, one to gather them into rows, and the others to elevate them. The three former machines gave sufficient promise of ultimate success to warrant the judges in recommending payment of a portion of the bonus, and advising that a further trial be held. Special stress was laid on the fact that to gather the stones into rows, free from soil, would answer the requirements of farmers.

On Wednesday, March 16th, the fifth of these trials was held on the farm of Mr. S. R. Price, situated about three and a half miles from Paskeville Railway Station. The field selected was very rough with stones, and had been out of cultivation for a number of years. To loosen the stones a set of heavy harrows was run over the ground before the trial.

Local arrangements were made by the chairman (Mr. A. Goodall) and secretary (Mr. L. Palm) of the Northern Yorke's Peninsula Bureau Field Trial Society, while the members of the Paskeville Branch of the Agricultural Bureau provided the necessary teams, some 20 horses in all, and conveyed the machines to and from the field.



Machine entered by Mr. W. Heithersay, of Belalie North.

The judges were Messrs. Hermann Koch and Paul Roach (of Kadina), and Mr. J. L. Williams (of the Roseworthy Agricultural College), while Mr. W. L. Summers (Secretary of the Advisory Board of Agriculture) acted generally as steward.

The first machine to be tested, Mr. J. von Bertouch's, was practically an ordinary stump-jump cultivator, with a special attachment of rakes to gather the stones into rows about 7ft. apart. In addition it had a scoop to gather the stones into heaps. This machine was practically out of the running after the first round, the rakes and tines not being sufficiently strong, and as a stone-gatherer the work it accomplished was of little value. The inventor, however, stated that he was satisfied that if a stronger machine was used the rakes would gather the stones all right.

The implement entered by Messrs. J. & R. Forgan, of Crystal Brook, consisted of attachments to a standard V-shaped stump-jump cultivator,

the stones being raked together into rows about 7ft. 6in. apart. It did very effective work, and gathered the stones fairly free from soil, leaving them in narrow, well-defined rows, whence they could be easily picked up with forks into wagons and carted off the field.

Mr. J. C. Davies, of Port Pirie, had a machine built on somewhat similar principles; but, instead of distributing the stones into rows, collected them into heaps. Unfortunately, this implement met with an accident, and no opportunity was afforded to test it properly. Mr. W. Heithersay, of Belalie North, had the same machine as at the previous trial. This gathers the stones into heaps, but the hopper at the rear did not work too well. With any but very large stones this is a cheap and effective implement for use on land free from stumps, and general regret was expressed that the alterations suggested by the committee last year had not been made, as the machine was altogether too light for the work required.

The judges reported—"After careful consideration of the work done by machines, the judges have awarded J. & R. Forgans' 83 points, and Mr. Heithersay's 62, made up as under:—

JUDGES' AWARD.

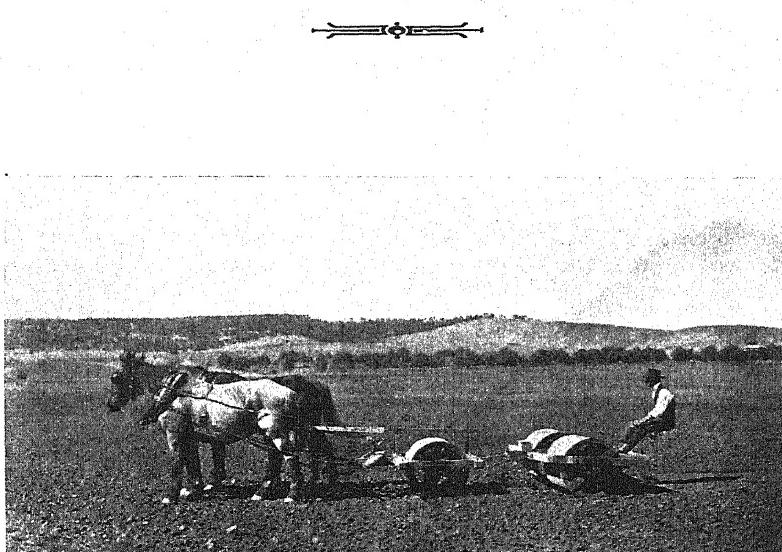
	Maximum Points.	J. & R. Forgans' Machine.	W. Heithersay's Machine.
Efficiency	45	40	25
Gathering stones free from soil	19	7	7
Cost of clearing	20	15	9
Strength of machine	10	9	6
Simplicity of construction and working	7	5	7
Cost of machine	8	7	8
Total	100	83	62

"The other two machines having failed to stand the test, have not been brought into the judging. The judges are of opinion that Forgans' machine has done as much as can be expected of any implement in such land. The stones are thoroughly cleaned up into rows, which could be rapidly picked up with forks, and put into drays. The land is also worked to a certain extent, and left in good condition to start the weeds before fallowing, and left cleaner than it would be if the stones were picked up by hand. The judges regret that Mr. Heithersay was unable to alter his machine, to make it heavier, and to gather the stones freer from soil. They believe that, with very little expense, it could be made to do effective work on land free from heavy stones and stumps. The judges propose to recommend the Government to allot the £50 bonus to Messrs. Forgan. In view of the fact that Mr. Heithersay received an award for practically the same machine at last trial, they cannot recommend any award on this occasion. The judges wish to point out that the stone-gathering attachment of Forgans' machine can be

affixed to practically any strong stump-jump cultivator or scarifier at a cost of about £13. In this machine the judges believe we have an efficient stone-gathering machine, which will considerably lessen the cost of removing stone from rough land."

It was generally agreed by those present that Forgan's machine was clearing the ground better than was the general practice with hand-picking, and that the work done was better than they had expected any of the machines to perform. This machine went over large stones and fixed stumps without injury. With a five-horse team and one man this implement would treat eight to 10 acres a day. For gathering stones for road-making in stony country it will undoubtedly prove an acquisition.

On behalf of Messrs. Forgan Mr. Davies moved a vote of thanks to the judges and committee. This was seconded by Mr. Heithersay and supported by Mr. von Bertouch. Mr. Paul Roach responded on behalf of the judges, and said he was pleased indeed that the trial had shown at least one machine capable of doing the work required. Mr. Heithersay stated after the trial that he had competed at the first contest nearly 25 years ago, and he was satisfied that the right principle had at last been adopted in removing the stones. In the original trials too much was asked of inventors, as it was out of the question to gather and elevate the stones into a dray with any simple, inexpensive machine.



A USEFUL FIELD ROLLER.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the above Board was held on Wednesday, March 9th, there being present Messrs. J. W. Sandford (chairman), C. J. Tuckwell, C. J. Valentine, R. J. Needham, J. Miller, C. Willcox, G. R. Laffer, and Col. Rowell.

The Acting Principal of Roseworthy College submitted details of examination for prize offered by the members of the Board for the best marks for practical work. He suggested that books to the value of £2 2s. be offered for the third-year students and of £1 1s. to second-year students. The Board approved of the suggestions of the Acting Principal.

Angaston Branch wrote, calling attention to the disadvantage producers of currants labored under owing to the absence of any regular market quotations in the daily papers. The Secretary was instructed to communicate with the editors of the *Register* and the *Advertiser*, and ask whether these quotations could not be published in their commercial columns, as was done with other lines of produce.

The Secretary stated that several of the Branches of the Bureau had made inquiries as to conditions of the proposed Molineux Memorial Scholarship at Roseworthy College. There seemed to be a feeling in some quarters that steps should be taken to limit the scholarship to the sons of persons actually engaged in cultivating the soil. On the motion of Col. Rowell it was resolved that no definite decision as to the conditions of proposed scholarship could be settled until they knew what money would be available; but in any case these details would have to be settled by the subscribers to the fund or by a committee appointed by the subscribers.

The formation of a Branch at Murray Bridge, with the following gentlemen as members, was approved:—Messrs. S. McIntosh, J. Doyle, R. A. Manning, F. Schottelius, J. Stecker, F. W. Lehmann, J. Lehmann, J. C. Kuchel, E. Kuchel, B. T. Jaensch, A. S. Martin, Eli Joyce T. S. Davis, A. J. Pulleine, and H. Taylor.

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. J. H. Gloede, Hookina; J. N. Robertson, Golden Grove; B. Barraud, Koppio; D. French, Wild Horse Plains; H. Hallion, Mallala; A. and R. Whittlesea and W. J. Sexton, Salisbury; C. Stigwood, Dawson; G. Barrett, Kingscote; G. W. Doley, Longwood; W. Napper, Johnsburg; J. Tonkin and G. Spring, Kadina; M. A. Cronin, Shannon; P. and O. Green,

Mitchell; J. Atkinson, W. B. Stacey, M. Magor, jun., and P. Champion, Moonta; J. L. Broadbent, Sutherlands; F. T. Cooper, A. Lloyd, and J. Elliott, Kybybolite.

The resolution from the Northern Conference, held at Georgetown—that the Government should be asked to arrange for the appointment of qualified veterinary surgeons in selected centres and to contribute a subsidy towards their salaries—was discussed. Members of the Board were generally of opinion that this was a matter that stockowners could deal with without Government assistance. If the farmers in different districts would combine to guarantee an adequate salary they would have no difficulty in securing the services of veterinary surgeons. It was resolved that the Board cannot indorse the resolution of the Conference.

Col. Rowell called attention to the few exhibits in the wheat sections at the March show. It was scarcely creditable to the farmers of South Australia that such a poor show of the chief cereal crop should be made year after year. The officers of the Agricultural Society were anxious to make this section of the show a success, and would be glad to know why there was so little competition. Mr. Miller thought it was chiefly due to the fact that most farmers were not in a position to clean and grade their wheat up to the weight per bushel necessary to win the prizes. The Secretary said he wondered whether the absence of competition was due to the fact that the majority of farmers did not attend the March show. It might be that there would be more competition in September, and more interest would undoubtedly be shown in the exhibits.

It was resolved that members of Branches be asked to say why there was so little competition, and to suggest how to secure a better exhibit at future shows.



EXPERIMENTAL FARM NOTES.

TURRETFIELD.

The work of wheat improvement being carried on at Parafield has developed to such an extent that it has been found necessary to provide a greater area for this purpose, and a block of about 400 acres has been accordingly set aside on the recently-purchased Government Dairy Stud Farm at Turretfield. Arrangements are now being made to put in a crop there of about 100 acres of land that have been prepared and fallowed. The idea in procuring this land was that as varieties became improved by selection and crossbreeding at Parafield they could then be transferred to Turretfield for further trial and for the growing of sufficient quantities of these varieties for distribution among the rest of the experiment farms and throughout the State. There can be no doubt that it is very necessary to supply the farmer with seed improved by selection, and clean and true to name, and the newly-acquired block at Turretfield will very much facilitate work in this direction.

KANGAROO ISLAND.

Much interest has been taken in the development of Kangaroo Island, and the Department of Agriculture arranged for experiments to be conducted at several centres last season, but for various reasons the results were not at all satisfactory. One great difficulty the Department had to contend with was the securing of suitable labor. The experimental farms are situated at a very considerable distance from the developed part of the island, and consequently their working was carried on at very great disadvantage. The Department came to the conclusion that a change was necessary, and they have sent over to the island a number of men and a team of horses to carry out the work of preparing three 15-acre blocks on the north and west of the hundred of Seddon for cropping this year. A comprehensive scheme of manurial and variety experiments has been arranged on the farm of Messrs. Wight and McPherson in the hundred of Cassini. A series of grass plots have also been arranged for on this farm. In the south, manurial experiments have been undertaken by Mr. Roberts.

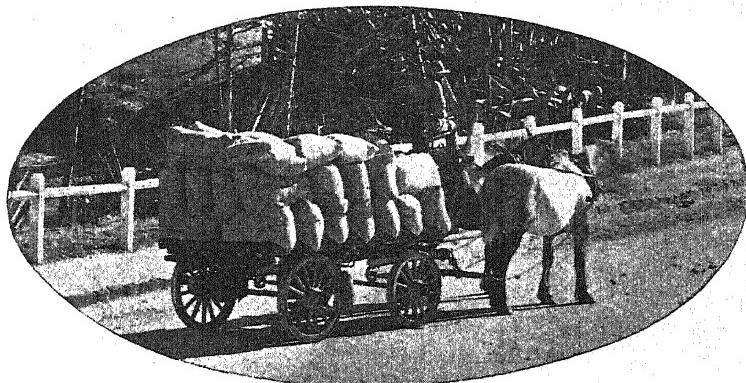
VEITCH'S WELL.

Good progress has been made with the work at the experimental station at Veitch's Well, in the Loxton district, since the new manager (Mr. Wilson) took charge of the place. A house of six rooms has now been finished, the

scrub on an area of about 540 acres has been burnt, and the land is now ready for ploughing. For cropping next season about 100 acres of late fallow have been prepared, and will be seeded forthwith. The rest will be ploughed and put in at a later date. A comprehensive scheme of experiments at this centre has been prepared, including amongst other things thin seeding as against thick seeding, cultivation experiments—that is, no ploughing, ploughing $4\frac{1}{2}$ in. deep, surface discing of the land previous to sowing, manurial experiments principally confined to the results obtained from using different quantities of phosphate, and variety experiments, wheat and oats. Of course, it is quite impossible to do very much on dry farming lines on land still holding the stumps, but next year a fair area will be fit for conducting such work.

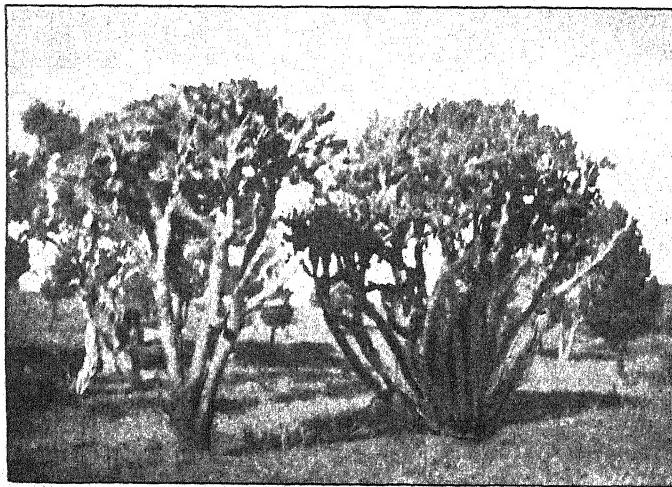
SHANNON.

The work on the Government Experimental Farm at Shannon, on Eyre's Peninsula, has now been commenced in preparation of the land for this season's crop. Mr. McLean left for the West Coast a fortnight ago, and he has a number of men engaged in burning the scrub off the 300 acres which has been rolled. It is expected to crop 200 acres of this area this season. A good deal of work will have to be performed before the place is in proper order—such as the erection of buildings, fencing, and the finding of water. The biggest item in pioneering work of this kind is the erection of the home-stead, and that will be deferred for some little time. Only temporary sheds and houses will be erected in the meantime. There is undoubtedly room for a farm of this nature on the West Coast, and as it is to be run on demonstration lines considerable interest will be taken in the work by residents of the district.



PRICKLY PEAR AS FODDER FOR STOCK.

A great deal has been written from time to time concerning the value of different varieties of *Opuntia* (prickly pear) as food for stock in dry districts. Throughout the semi-arid regions of America considerable attention has of late years been given to the cultivation of these *Opuntias*, and Senator McColl, in his report to the Federal Government, deals at some length with the experiments now being made in the United States, especially in Arizona and Texas, where fairly large areas have been planted to prickly pears as a fodder crop

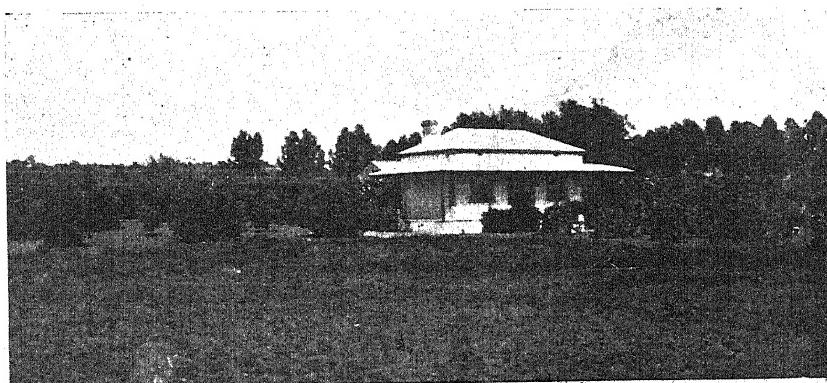


SPINELESS CACTUS AT ANGOORICHINA.

Stock eat all leaves within reach.

for stock. It is claimed that experiments have shown that one acre of pear will keep a cow for the whole year, provided some concentrated foods are also given. A great deal has also been heard of the results alleged to have been obtained by Burbank in the elimination of the spine, and the importance of the yield from these *Opuntias*. Recently Mr. J. V. Whyte, of Angoorichina Station, in the Far North, brought to the office of the Minister of Agriculture samples of seven different varieties of prickly pear, grown at the home station around the cultivated paddocks and in the garden. These were planted over 30 years ago for purposes of ornament,

when the station was held by the late H. C. Swan. So far, doubtless owing to the dry atmosphere, these have shown no tendency to spread to such an extent as to suggest the possibility of becoming a serious nuisance, as is the case in New South Wales and Queensland. Mr. Whyte states that whenever they are short of feed for milking cows use is made of the leaves. One of the varieties is practically thornless, and where stock can get at it they eat all the leaves within reach. With the other varieties the thorns are scorched off before being given to the cows, which have now become very fond of this fodder, and do well on it. There is considerable difference, not only in the growth, but in the palatableness of the different varieties, and the cows show a decided preference for a thick round leaf kind with strong thorns, while the practically spineless variety comes next. Mr. Whyte is of opinion that in our Far Northern districts, where dairying has been adopted extensively, that a five-acre paddock of prickly pear would be a valuable standby. Once the plants are well established, say four years old, he is of opinion that an acre of prickly pear would keep 10 head of cattle for three months in the year, provided there was a fair supply of dry feed in addition, as by itself the pear causes scouring. He has a decided preference for the strong, thorny kind, as there is no necessity to fence it off, and it is not injured by rabbits. More labor is, of course, involved than is the case with the thornless variety, but he is of opinion that this is compensated for by the fact that it is unnecessary to protect it against stock and rabbits.



BRANCH BUREAUS AND ARBOR DAY.

By R. H. BALL, Angaston.

The institution of an annual Arbor Day in connection with the public schools throughout the State was a wise provision, which, if carried out in its entirety, could not have failed to be of great ultimate benefit to the community, as it would not only provide interesting and useful lessons to the pupils in tree planting and culture, but would awaken in their minds at an impressionable age an interest in planting trees for ornamentation, shelter, shade for live stock in summer, and for a reserve of timber for future needs. But, although it has now been established for a number of years, there is good reason to fear that the objects aimed at have by no means been attained. In many districts Arbor Day is quite ignored ; in others it is regarded as an excuse for a school holiday, and the planting, if any, is hurried and perfunctory ; in others again, although a fair number of trees or shrubs are planted, the work is done in a haphazard fashion, without expert assistance or instruction. Nothing is done to arouse a living interest in the children, or to impress them with the importance of the ceremony. After the day itself no further thought is bestowed on the plants, and the great majority perish for lack of a little care and attention, and those that struggle through show poor growth. The same thing occurs year after year. Doubtless there are some districts where Arbor Day is carried out in the spirit hoped for by its original promoters ; but these are exceptions, and, speaking generally, there is a deplorable lack of interest and enthusiasm.

At a joint meeting of Lyndoch and Angaston Branch Bureaus, held at Lyndoch in September, 1908, after listening to a thoughtful paper by Mr. Mitchell, of Williamstown, on the wanton destruction of our native forests, I pointed out that a proper and general observance of Arbor Day would go far to mitigate the evil, not only by encouraging increased planting, but by impressing on the growing generation the criminal wastefulness of unnecessarily destroying any growing trees, and by inculcating a desire to plant rather than destroy, and suggested that probably much good might be done by the Branch Bureaus throughout the country co-operating with the local Boards of Advice with a view to placing Arbor Day on a sound practical footing. I appeal to all members of the Bureau to do all in their power to bring about the co-operation suggested, and to raise Arbor Day from a dry skeleton to a living benificent national institution. The trouble will be small and the reward certain, and in proportion to the earnestness

and thoroughness of the workers. The Government afford every facility by the free distribution of trees of various kinds, and should any special varieties be desired surely there is no district in South Australia that cannot afford the few shillings necessary for their purchase and freight.

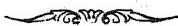
The Advisory Board of Agriculture and the Branch Bureaus have done, and are doing, an immense amount of useful work, and if they take up this matter, which is well within their province, and carry it to a successful issue, it will certainly not be one of the least worthy of their achievements.

It is possible that full consideration may induce members of Bureaus to take interest in tree-planting on their own account, independently of Arbor Day, and this will be an added benefit. As a matter of picturesqueness surely no one would prefer a bare plain or hillside or road to one shaded with graceful trees, and no owner who has regard for the wellbeing of his stock would prefer for them a bare paddock to one provided with trees here and there for shade from heat, and clumps for shelter from cold, rough weather. Even in cultivation paddocks clumps in the corners take little room, and afford shelter; and a row or double row of trees on the margins would mitigate damage from winds.

The time is not far distant when timber trees suitable to local conditions and fit for any commercial use will be a valuable asset; and, as the cost of planting a tree and giving it a fair start is very small, and thereafter it is constantly growing in value without attention or expense, planting may be regarded as a sound commercial speculation, and worthy of the attention of every landholder. At one time the forests of America were considered inexhaustible, but already the Americans are viewing with apprehension the rapid diminution of their reserves of timber. In India the British Government have found it necessary to establish, at great expense, a Department of Forestry to carry out the re-afforestation of the country, owing to past denudation.

In view of these facts it behoves us to preserve our natural forests wherever practicable, and should clearance of timber be necessary for any special purpose, to encourage planting elsewhere to maintain a balance.

Another point may be touched on incidentally. It is generally admitted that the denudation of large areas of forest land materially reduces rainfall, and in a country like South Australia this is worthy of consideration.



ANALYSES OF FERTILISERS.

By W. L. SUMMERS, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers taken during the past few months, are published for general information. In each case the certificate of constituents or guarantee registered by the vendor is shown in parentheses, thus (36 per cent.), immediately before the results of the analyses:—

Adelaide Chemical and Fertilizer Company, Limited—Mineral super., water-soluble phosphate (36 per cent.), 39·1 per cent., 37·8 per cent.

Adelaide Chemical and Fertilizer Company, Limited—S.A. super., water-soluble phosphate (30 per cent.), 33·4 per cent., 33·8 per cent., 32·3 per cent.

Adelaide Chemical and Fertilizer Company, Limited—Super. B., water-soluble phosphate (16 per cent.), 14·7 per cent., 17·2 per cent.; citrate-soluble phosphate (14 per cent.), 22·3 per cent., 23·6 per cent.; acid-soluble phosphate (8 per cent.), not tested.

Adelaide Chemical and Fertilizer Company, Limited—Guano super., water-soluble phosphate (25 per cent.), 32·4 per cent., 27·3 per cent., 28·6 per cent.; citrate-soluble phosphate (5 per cent.), 4·2 per cent., 6·5 per cent., 4·6 per cent.; acid-soluble phosphate (8 per cent.), not tested.

Adelaide Chemical and Fertilizer Company, Limited—Wheat manure, water-soluble phosphate (28 per cent.), 31·4 per cent.; citrate-soluble phosphate (5 per cent.), 11·8 per cent.; acid-soluble phosphate (7 per cent.), 4·2 per cent.; nitrogen (1·05 per cent.), 1·01 per cent.

Adelaide Chemical and Fertilizer Company, Limited—Bonedust, nitrogen, (3·25 per cent.), 3·74 per cent.; acid-soluble phosphate (45 per cent.), 48 per cent.

E. Anders & Sons—Bonedust, nitrogen (3 per cent.), 4·30 per cent.; acid-soluble phosphate (40 per cent.), 46·3 per cent.

Bagot, Shakes, & Lewis, Limited—Japan super., water-soluble phosphate (38 per cent.), 40·3 per cent., 40·4 per cent.

Crompton & Son—Bonedust, nitrogen (3·8 per cent.), 4·10 per cent.; acid-soluble phosphate (44·67 per cent.), 46·3 per cent.; fertiliser, nitrogen (3·3 per cent.), 3·28 per cent.; potash (3·8 per cent.), 0·14 per cent.; acid-soluble phosphate (1·20 per cent.), not tested.

Elder, Smith, & Company, Limited—Lawes' super., water-soluble phosphate (36 per cent.), 39·3 per cent., 38·4 per cent.; superphosphate, water-soluble phosphate (36 per cent.), 39·4 per cent.

A. H. Hasell—Superphosphate, water-soluble phosphate (38 per cent.), 40·8 per cent., 41·9 per cent.

Mount Lyell Mining and Railway Company, Limited—Standard super., water-soluble phosphate (36 per cent.), 37·2 per cent., 38·9 per cent., 41·9 per cent.; citrate-soluble phosphate (2·18 per cent.), not tested; acid-soluble phosphate (4·36 per cent.), not tested.; Adelaide super., water-soluble phosphate (30 per cent.), 38·1 per cent.; citrate-soluble phosphate (2·18 per cent.), not tested; acid-soluble phosphate (4·36 per cent.), not tested.

Norman & Co.—Super., water-soluble phosphate (36 per cent.), 39·2 per cent., 37·8 per cent.; acid-soluble phosphate (3 per cent.), not tested; Thomas phosphate, acid-soluble phosphate (30 per cent.), 31·6 per cent.

Wallaroo Phosphate Company—Super., water-soluble phosphate (36 per cent.), 35·9 per cent., 41·3 per cent., 39·5 per cent.; Y.P. super., water-soluble phosphate (30 per cent.), 33·4 per cent.

Wills & Co.—Globe super., water-soluble phosphate (36 per cent.), 41·1 per cent.

AGRICULTURAL EXPERIMENTAL WORK, 1909-10.

By WILLIAM ANGUS, B.Sc., Director of Agriculture.

(Continued from page 645.)

Wheat production is the staple industry of this State, and consequently it is important for the farmers in the various districts to know (1) the varieties best suited to that district, and (2) the manures required so as to give the most profitable yield. Variety and manurial experiments have, therefore, been arranged in various wheat-growing districts of the State.

WHEAT VARIETIES TEST.

These have been carried on at Rhine Villa, Bews, Caltowie, and Koolunga for five years. The conditions existing in these different districts are such as to make the test of very considerable importance. Here were sown several of the older varieties of wheat along with some of our best newer varieties, and it is gratifying to find that in nearly every case the best new wheats held their own against the varieties grown previous to their introduction.

TABLE I.—*Wheat Varieties Test.*

Variety.	Year.	J. W. Vigor, Rhine Villa, Bush. $\frac{P}{A}$ Acre.	R. Barr, jun., Bews, Bush. $\frac{P}{A}$ Acre.	F. Lehmann, Caltowie, Bush. $\frac{P}{A}$ Acre.	J. Sandow, Koolunga, Bush. $\frac{P}{A}$ Acre.
Yandilla King .	1905	11	13 $\frac{1}{4}$	35 $\frac{1}{4}$	32
	1906	9 $\frac{1}{2}$	23	29 $\frac{1}{4}$	20 $\frac{1}{2}$
	1907	21 $\frac{1}{2}$	8 $\frac{1}{2}$	33 $\frac{1}{4}$	13 $\frac{1}{4}$
	1908	22 $\frac{3}{4}$	7 $\frac{1}{2}$	17 $\frac{3}{4}$	16 $\frac{1}{2}$
	1909	25 $\frac{1}{2}$	23 $\frac{3}{4}$	25 $\frac{1}{2}$	38 $\frac{3}{4}$
Average ...		18	15	28	24
Dart's Imperial.	1905	14 $\frac{1}{4}$	16 $\frac{1}{4}$	31	—
	1906	8	22	29	19
	1907	18 $\frac{1}{2}$	12 $\frac{1}{4}$	26	13 $\frac{3}{4}$
	1908	25 $\frac{1}{4}$	7 $\frac{1}{2}$	15 $\frac{3}{4}$	16
	1909	24	22 $\frac{1}{4}$	22 $\frac{1}{2}$	31
Average.....		18	16	25	20
Federation.....	1905	6 $\frac{1}{2}$	10 $\frac{1}{2}$	—	26
	1906	12 $\frac{1}{4}$	19 $\frac{1}{4}$	33 $\frac{1}{4}$	17
	1907	17 $\frac{1}{4}$	14 $\frac{1}{4}$	29 $\frac{1}{2}$	8 $\frac{1}{4}$
	1908	30	6 $\frac{1}{2}$	19	15
	1909	—	18	26 $\frac{1}{2}$	37 $\frac{1}{4}$
Average.....		16 $\frac{2}{3}$	13 $\frac{1}{3}$	27	21

TABLE I.—*Wheat Varieties Test*—continued.

Variety.	Year.	J. W. Vigar, Rhine Villa, Bush. $\frac{P}{A}$ cre.	R. Barr, jun., Bews, Bush. $\frac{P}{A}$ cre.	F. Lehmann, Caltowie, Bush. $\frac{P}{A}$ cre.	J. Sandow, Koolunga, Bush. $\frac{P}{A}$ cre.
Marshall's No. 3	1905	11	11 $\frac{1}{2}$	30 $\frac{1}{4}$	27 $\frac{1}{4}$
	1906	5 $\frac{1}{2}$	21 $\frac{1}{4}$	27	16 $\frac{1}{4}$
	1907	17 $\frac{3}{4}$	13 $\frac{1}{2}$	28	11 $\frac{1}{2}$
	1908	21	6 $\frac{1}{4}$	17 $\frac{3}{4}$	14 $\frac{1}{4}$
	1909	16 $\frac{3}{4}$	18 $\frac{1}{4}$	25 $\frac{1}{2}$	32 $\frac{1}{2}$
Average.....		14 $\frac{1}{3}$	14	25 $\frac{2}{3}$	20 $\frac{2}{3}$
Carmichael's Eclipse	1905	7	10 $\frac{1}{2}$	—	22 $\frac{3}{4}$
	1906	11 $\frac{1}{2}$	21 $\frac{1}{4}$	—	21 $\frac{1}{2}$
	1907	18 $\frac{1}{2}$	14 $\frac{1}{2}$	—	7 $\frac{1}{4}$
	1908	21 $\frac{1}{2}$	6 $\frac{1}{2}$	—	9 $\frac{1}{2}$
	1909	21 $\frac{1}{2}$	14	—	30 $\frac{3}{4}$
Average.....		16	13 $\frac{1}{2}$	—	18
Comeback	1905	7	9 $\frac{1}{4}$	21	—
	1906	13	23	22 $\frac{1}{2}$	20 $\frac{1}{4}$
	1907	15 $\frac{1}{4}$	14 $\frac{1}{2}$	22 $\frac{1}{4}$	5
	1908	21 $\frac{1}{2}$	4	12 $\frac{1}{4}$	8 $\frac{1}{4}$
	1909	19	13	—	30 $\frac{3}{4}$
Average.....		15 $\frac{1}{3}$	13	15 $\frac{3}{4}$	16
Silver King	1905	—	13	33 $\frac{3}{4}$	—
	1906	—	22	26 $\frac{1}{2}$	—
	1907	—	12 $\frac{1}{2}$	26 $\frac{1}{3}$	—
	1908	—	6 $\frac{1}{4}$	21 $\frac{1}{2}$	—
	1909	—	17	22 $\frac{1}{4}$	—
Average.....		—	14	26	—
Phillis' Marvel .	1905	—	10 $\frac{1}{4}$	30	—
	1906	—	22 $\frac{1}{4}$	25 $\frac{3}{4}$	—
	1907	—	14 $\frac{1}{4}$	28 $\frac{1}{2}$	—
	1908	—	6 $\frac{1}{4}$	15 $\frac{1}{2}$	—
	1909	—	19 $\frac{1}{4}$	—	—
Average.....		—	14 $\frac{1}{3}$	25	—
Nhill	1905	14 $\frac{1}{2}$	—	—	29
	1906	25 $\frac{1}{4}$	—	—	16 $\frac{3}{4}$
	1907	12 $\frac{1}{4}$	—	—	7 $\frac{1}{4}$
	1908	6	—	—	9 $\frac{1}{2}$
	1909	20 $\frac{1}{4}$	—	—	32
Average.....		15 $\frac{1}{3}$	—	—	18 $\frac{1}{3}$
Gluyas	1905	—	16 $\frac{1}{4}$	—	—
	1906	—	19 $\frac{1}{4}$	—	—
	1907	—	14 $\frac{1}{2}$	—	—
	1908	—	7	—	—
	1909	—	24 $\frac{1}{2}$	—	—
Average.....		—	16 $\frac{1}{3}$	—	—

As will be seen from the above table, the results have been arranged this year so as to give the averages for each variety at each centre. Yandilla King, Dart's Imperial, Federation, and Gluyas come out top at nearly all the four centres. It is gratifying to find, however, that Comeback beats Marshall's No. 3 at Rhine Villa, and is only a bushel behind Marshall's No. 3 at Bews, but it is far behind that variety both at Caltowie and Koolunga.

The results are made sufficiently clear in the table, and call for no further comment.

There are various centres throughout the State where variety tests were commenced later than those discussed in the previous table. It was thought desirable, therefore, to give the results of each centre separately, especially as the varieties tested differed in each of these districts.

BAGSTER, WEST COAST (Mr. T. Freeman).

Beginning with Bagster, on the West Coast, the following table gives the results for the three years 1907, 1908, 1909 :—

Sown with 65lbs. mineral super. per acre—

Variety.	1907. Bush.	1908. Bush.	1909. Bush.	Average for 3 Years. Bush.
Gluyas	16 ..	10 $\frac{1}{4}$..	15 $\frac{1}{2}$..	14 ..
Nhill	13 ..	12 ..	14 $\frac{1}{2}$..	13 ..
King's Early	11 ..	12 $\frac{1}{2}$..	15 ..	13 ..
Boomerang.....	11 $\frac{1}{2}$..	10 ..	9 $\frac{1}{2}$..	10 $\frac{1}{4}$
Comeback.....	8 ..	12 ..	9 $\frac{1}{4}$..	9 $\frac{3}{4}$
Allora Spring	8 ..	8 $\frac{1}{2}$..	12 ..	9 $\frac{1}{2}$
Smart's Early	8 ..	10 ..	9 $\frac{1}{2}$..	9 ..
Yandilla King	4 $\frac{1}{2}$..	9 ..	12 $\frac{1}{2}$..	8 $\frac{3}{4}$
Dart's Imperial	4 ..	8 ..	14 $\frac{1}{2}$..	8 $\frac{3}{4}$
Marshall's No. 3	5 ..	8 ..	12 $\frac{1}{4}$..	8 $\frac{1}{2}$
Carmichael's Eclipse..	7 $\frac{1}{2}$..	7 $\frac{1}{2}$..	10 ..	8 $\frac{1}{4}$
Red Straw	6 ..	8 ..	8 $\frac{1}{2}$..	7 $\frac{1}{2}$

Here Gluyas, Nhill, and King's Early—all three early varieties—take premier place, and it is noticeable that Comeback beats Yandilla King, Marshall's No. 3, and Carmichael's Eclipse.

STREAKY BAY (Mr. A. E. Lovegrove).

The next centre dealt with is Streaky Bay, further down on the West Coast, where Federation takes first place, followed by Dart's Imperial, Yandilla King, and Carmichael's Eclipse.

Sown with 80lbs. mineral super. per acre—

Variety.	1907. Bush.	1908. Bush.	1909. Bush.	Average for 3 Years. Bush.
Federation	4 $\frac{3}{4}$	20	20 $\frac{1}{2}$	15
Dart's Imperial	2	11 $\frac{3}{4}$	17 $\frac{1}{2}$	10 $\frac{1}{2}$
Yandilla King	3	12	16 $\frac{1}{4}$	10 $\frac{1}{4}$
Carmichael's Eclipse..	4 $\frac{1}{4}$	12 $\frac{3}{4}$	11	9 $\frac{1}{4}$
Comeback.....	2	11 $\frac{1}{2}$	12 $\frac{3}{4}$	8 $\frac{3}{4}$
Gallant	2	10	10 $\frac{3}{4}$	7 $\frac{1}{2}$
Neumann's Early	2 $\frac{1}{2}$	9 $\frac{1}{4}$	—	6

KOPPIO (Mr. J. H. Newell).

On the eastern side of the peninsula we have a centre at Koppio, where the results are as follows:—

Sown with 112lbs. mineral super. per acre—

Variety.	1907. Bush.	1908. Bush.	1909. Bush.	Average for 3 Years. Bush.
Federation	24 $\frac{1}{4}$	12	9	15
Yandilla King	21 $\frac{1}{2}$	11	4 $\frac{3}{4}$	12 $\frac{1}{2}$
Purple Straw	19	12 $\frac{1}{4}$	6 $\frac{1}{4}$	12 $\frac{1}{2}$
Dart's Imperial	18	12	6 $\frac{3}{4}$	12 $\frac{1}{4}$
Comeback.....	13 $\frac{3}{4}$	9 $\frac{1}{2}$	—	11 $\frac{1}{2}$
Majestic	19 $\frac{3}{4}$	9 $\frac{1}{2}$	4 $\frac{1}{4}$	11 $\frac{1}{4}$
Gluyas	—	8	7 $\frac{1}{2}$	7 $\frac{3}{4}$
Gallant	—	8 $\frac{3}{4}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$
Neumann's Early	—	6 $\frac{1}{2}$	7 $\frac{1}{4}$	6 $\frac{3}{4}$
King's Early	—	7 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$
Silver King	—	—	3 $\frac{3}{4}$	3 $\frac{3}{4}$

In 1908 and 1909 the yields at this centre were considerably reduced by the crops being damaged by hot winds. Here Federation is considerably ahead of the others, while Yandilla King, Purple Straw, and Dart's Imperial make good seconds, followed by Comeback.

SHANNON (Mr. J. J. Cronin).

A large tract of new land is being opened up by the line of railway from Port Lincoln to Yeelanna. Last season a centre was established in the hundred of Shannon, and the following table gives the results of the wheat varieties test:—

Variety.	Yield per Acre. Bush. Lbs.
Federation	13 33
Neumann's Early	12 20
Gluyas	11 39
Walker's	10 23

It will be seen that only four varieties were tested, and of these Federation takes first place, with a yield of $13\frac{1}{2}$ bush.

COONALPYN (Mr. G. E. Venning).

In the Coonalpyn district the experiment with varieties has extended only over two years. Unfortunately, the results of 1909 were seriously interfered with by excessive wet during the winter season. The following table gives the results :—

Sown with 112lbs. mineral super. per acre—

Variety.	1908.	1909.	Average for 2 Years.
	Bush.	Bush.	Bush.
Yandilla King	10	$5\frac{3}{4}$	8
Federation	$7\frac{1}{2}$	—	$7\frac{1}{2}$
Carmichael's Eclipse	$6\frac{3}{4}$	—	$6\frac{3}{4}$
Comeback	$6\frac{1}{2}$	—	$6\frac{1}{2}$
Gluyas	8	5	$6\frac{1}{2}$
Neumann's Early	8	$5\frac{1}{4}$	$6\frac{1}{2}$
King's Early	$8\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{2}$
Dart's Imperial	$8\frac{3}{4}$	4	$6\frac{1}{2}$

LAMEROO (Mr. F. W. Eime).

The newly-developed district of Pinnaroo has within the last three years produced a large quantity of wheat, and it is likely to become one of the best wheat-producing areas in the State. It is well, therefore, to have at as early a date as possible reliable information as to which varieties of wheat will give the heaviest yield in this class of country.

In 1908 a variety experiment was commenced on the farm of Mr. F. W. Eime, of Lameroo, and, as will be seen from the following table, Federation leads in both years, followed by Dart's Imperial, Baroota Wonder, and Comeback. It is intended to increase the number of varieties at this centre.

Sown with 112lbs. mineral super. per acre—

Variety.	1908.	1909.	Average for 2 Years.
	Bush.	Bush.	Bush.
Federation	$22\frac{3}{4}$	32	$27\frac{1}{2}$
Dart's Imperial	19	$28\frac{1}{4}$	$23\frac{1}{2}$
Baroota Wonder	$18\frac{3}{4}$	$24\frac{3}{4}$	$21\frac{3}{4}$
Comeback	$16\frac{1}{2}$	$21\frac{3}{4}$	19
Bobs	18	19	$18\frac{1}{2}$
Majestic	15	—	15

HAMMOND (Mr. T. Griffin).

There is a large tract of very good wheat country in the Hammond and Quorn districts, but unfortunately the rainfall is small and unreliable. On the farm of Mr. T. Griffin, Hammond, a variety test was carried out alongside the splendidly conducted dry farming plots. The 1908 yields are small, but this last season they were particularly good. The number of varieties was increased last season by adding Special Comeback and Cumberland, seed of these having been supplied from Parafield. In this year's results, strangely enough, Special Comeback takes premier place, followed by Viking and Gluyas. It is evident, however, that John Brown is unsuited to this district.

Sown with 60lbs. mineral super. per acre—

Variety.	1908.		1909.		Average for 2 Years. Bush.
	Bush.	Bush.	Bush.	Bush.	
Special Comeback	—	..	17½	..	17½
Cumberland	—	..	15½	..	15½
Viking	8	..	16½	..	12½
Gluyas	7½	..	16¾	..	12
Federation	8¾	..	14½	..	11½
Pratt's Comeback	8	..	14½	..	11¼
Yandilla King	7¾	..	12¾	..	10¼
John Brown.....	7½	..	8¾	..	8

From a study of these experiments it will be seen that the extension of the experimental work during the last few years has been in the direction of testing the newly-developed country and country where the rainfall is uncertain for wheat production. This, I think, is as it should be, and it is the intention of the department to still further extend the experimental work in this direction. In our areas of assured rainfall it is, of course, desirable to know the varieties that are most suited to these various districts; but farmers there have years of experience to guide them, which the farmer in the newer districts has not yet acquired; hence the desirability of still further extending our experimental work in these areas.

COMPLETE v. INCOMPLETE MANURE EXPERIMENTS.

This experiment has been carried on at Saddleworth, Wilmington, and Coonalpyn. At the two former centres the work has extended over a period of five years, and the results are therefore of a valuable nature. At Coonalpyn, however, in the more recently developed country, the experiment has been in existence for only two seasons.

The following table gives the results in detail :—

TABLE II.—COMPLETE & INCOMPLETE MANURES FOR WHEAT.

Table showing Yield per Acre for each Season. Averages over Series of Years, and Cost of Manure per Acre.

Centre.	Year.	Plot 1.		Plot 2.		Plot 3.		Plot 4.		Plot 5.		Plot 6.		Plot 7.		Plot 8.	
		Lewt. Min. Super. Soda.	Lewt. Min. Super. Lime.	Lewt. Min. Super. Lime.	Lewt. Sul. Potash. Lewt. Nit. Soda.	Lewt. Bone super.	Lewt. Sul. Potash. Lewt. Nit. Soda.	No Manure.	Lewt. Min. Super. Lewt. Sul. Potash.	Lewt. Sul. Potash. Lewt. Nit. Soda.							
F. Coleman, Saddleworth...{	1905	31	bush.	29 $\frac{3}{4}$	bush.	33 $\frac{3}{4}$	bush.	34 $\frac{1}{2}$	bush.	29 $\frac{3}{4}$	bush.	35	bush.	30 $\frac{3}{4}$	bush.	33 $\frac{1}{4}$	bush.
	1906	32 $\frac{1}{4}$	"	34 $\frac{1}{4}$	"	32 $\frac{1}{4}$	"	34	"	23 $\frac{3}{4}$	"	33 $\frac{1}{4}$	"	24 $\frac{1}{4}$	"	36 $\frac{1}{4}$	"
	1907	35 $\frac{1}{4}$	"	38 $\frac{1}{4}$	"	39 $\frac{1}{4}$	"	38 $\frac{1}{4}$	"	24 $\frac{1}{4}$	"	35 $\frac{1}{4}$	"	25 $\frac{1}{4}$	"	3 $\frac{1}{4}$	"
	1908	17 $\frac{1}{2}$	"	19 $\frac{1}{2}$	"	21	"	17 $\frac{1}{2}$	"	7 $\frac{1}{2}$	"	19 $\frac{1}{2}$	"	9	"	19	"
	1909	31 $\frac{1}{4}$	"	33 $\frac{1}{4}$	"	35	"	30 $\frac{3}{4}$	"	29 $\frac{1}{4}$	"	29 $\frac{1}{4}$	"	23 $\frac{1}{4}$	"	33 $\frac{1}{4}$	"
	—	29 $\frac{1}{4}$	"	31	"	32 $\frac{1}{4}$	"	30 $\frac{3}{4}$	"	22	"	30 $\frac{3}{4}$	"	22	"	31 $\frac{1}{4}$	"
	1905	20	"	20 $\frac{1}{4}$	"	21	"	21 $\frac{1}{4}$	"	15 $\frac{1}{4}$	"	24 $\frac{1}{4}$	"	17 $\frac{1}{4}$	"	22	"
	1906	35 $\frac{1}{4}$	"	33 $\frac{1}{4}$	"	32	"	31 $\frac{1}{4}$	"	23 $\frac{1}{4}$	"	27 $\frac{1}{4}$	"	22 $\frac{1}{4}$	"	30	"
	1907	18 $\frac{1}{4}$	"	21 $\frac{1}{4}$	"	19 $\frac{1}{4}$	"	19 $\frac{1}{4}$	"	12 $\frac{1}{4}$	"	20 $\frac{1}{4}$	"	15 $\frac{1}{4}$	"	17 $\frac{1}{4}$	"
	1908	24 $\frac{1}{4}$	"	32	"	35 $\frac{1}{4}$	"	32 $\frac{1}{4}$	"	32 $\frac{1}{4}$	"	23 $\frac{1}{4}$	"	30	"	30	"
J. Schuppen, Wilmington...{	1909	18 $\frac{1}{4}$	"	21	"	18	"	17 $\frac{1}{4}$	"	12 $\frac{1}{4}$	"	16 $\frac{1}{4}$	"	14 $\frac{1}{4}$	"	18 $\frac{1}{4}$	"
	—	23 $\frac{1}{2}$	"	25 $\frac{1}{2}$	"	25 $\frac{1}{2}$	"	26	"	17 $\frac{1}{4}$	"	24 $\frac{1}{4}$	"	18 $\frac{1}{4}$	"	23 $\frac{1}{4}$	"
	1908	19	"	14 $\frac{1}{4}$	"	14 $\frac{1}{4}$	"	15 $\frac{1}{4}$	"	12 $\frac{1}{4}$	"	6 $\frac{1}{2}$	"	6 $\frac{1}{2}$	"	14 $\frac{1}{4}$	"
	1909	12 $\frac{1}{2}$	"	12 $\frac{1}{2}$	"	15	"	13	"	13	"	7	"	7	"	12 $\frac{1}{2}$	"
	—	10 $\frac{1}{2}$	"	13 $\frac{1}{2}$	"	15	"	14 $\frac{1}{2}$	"	6 $\frac{1}{2}$	"	12 $\frac{1}{2}$	"	6 $\frac{1}{2}$	"	13 $\frac{1}{2}$	"
Cost of manure per acre...{	—	s. d.		s. d.		s. d.		s. d.		s. d.		s. d.		s. d.		s. d.	
	—	4 0	9 10	18 0		5 6		—		11 0		14 0		11 0		11 0	
Average increase per acre over unmanured crop at all stations		—	6 bush.	8 $\frac{1}{2}$ bush.	8 $\frac{1}{2}$ bush.	8 $\frac{1}{2}$ bush.	—	—	—	7 $\frac{1}{2}$ bush.	—	0 $\frac{1}{2}$ bush.	—	7 $\frac{1}{2}$ bush.	—	7 $\frac{1}{2}$ bush.	—

Analysing the results from the Saddleworth plots we find that there is little to choose between the mineral super. and bone super., with the advantage slightly in favor of the latter. Although some of the other plots show a greater yield, this advantage is more than counterbalanced by the extra cost.

At Wilmington and Coonalpyn bone super. does best when the cost of manuring is taken into consideration. These districts have both a fairly heavy rainfall, and this form of super. seems to suit the local conditions better than the mineral super.

The following table shows at a glance the average increase over the unmanured plot at each of these three centres :—

Plots.	1.	2.	3.	4.	6.	7.	8.
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Saddleworth...	7.75	9	10.25	8.75	8.75	.75	9.5
Wilmington ...	5.75	8	7.5	7.25	6.5	.75	5.75
Coonalpyn ...	4.5	7.5	8.75	8.25	6.25	.25	7.25

It will be seen that where no phosphates have been applied (plot 7) the increase due to the application of other forms of manure is not worth taking into consideration.

HAY TESTS.

A very interesting experiment has been carried on in the Southern District on the best varieties of wheat for hay production. The two centres chosen were Mount Barker and Aldinga.

Last year we had to report that owing to continued wet and cold weather during the winter season, followed by a dry spring, the yields from the plots were not so high as they might have been under more favorable conditions. This year the conditions have been very similar, except perhaps that the winter has been even wetter. In districts like Mount Barker and Aldinga the best results are obtained when the winter season is comparatively dry and mild.

The following tables show the results of the plots at each of the centres :—

A.—MOUNT BARKER (Messrs. Pope Bros.).

Sown with 1½ cwts. bone super. and 90lbs. seed per acre—

Variety.	Yield per Acre.					
	1908.			1909.		
	Tons.	Cwts.	Lbs.	Tons.	Cwts.	Lbs.
Phillis Marvel	1	17	0	—	—	—
Gallant	1	17	15	—	—	—
Baroota Wonder	1	14	95	2	1	8
White Tuscan	2	0	83	2	8	56
Triumph	1	13	95	—	—	—
Majestic	1	11	96	—	—	—
Silver King	1	18	47	1	12	0
Yandilla King	—	—	—	1	10	1
Huguenot	—	—	—	3	0	70
Tarragon	—	—	—	2	3	0
Leak's Rustproof.....	—	—	—	2	8	24
Correll's No. 7	—	—	—	2	11	0

Unfortunately at this centre several of the varieties had to be dropped last season on account of the difficulty of obtaining good seed.

B.—ALDINGA (Mr. T. Pengilly).

Sown with 1½ cwts. bone super. and 90lbs. seed to the acre—

Variety.	1908.					1909.				
	Hay.			Grain.		Hay.			Grain.	
	Tons.	Cwts.	Lbs.	Bush.	Lbs.	Tons.	Cwts.	Lbs.	Bush.	Lbs.
Phillis Marvel	2	8	38	20	25	—	—	—	—	—
Gallant	2	17	26	24	19	2	3	25	16	36
Baroota Wonder..	2	11	99	21	14	2	12	0	15	14
White Tuscan	3	12	102	28	45	2	18	99	21	8
Triumph	2	5	11	19	1	2	3	34	16	11
Majestic	3	10	2	27	21	1	12	96	12	0
Silver King	2	9	57	24	8	1	14	79	13	35
Yandilla King ...	2	8	67	24	42	1	12	27	13	33
Dart's Imperial...	—	—	—	—	—	2	3	86	16	33

At this centre the experiment is made more interesting by the fact that half of each of the 2-acre plots is allowed to stand for grain. It is very often found an advantage to know which variety will give the best hay return and at the same time, if not needed for hay, will yield well in grain. It might be called a test of the best dual-purpose variety of wheat. The results are very satisfactory, and show the superiority from a dual-purpose point of view of such varieties as White Tuscan, Triumph, and Gallant, which are now being largely grown in the district.

MANURE TESTS ON GRASS LANDS.

The practice of manuring pasture lands is not largely followed in South Australia, probably because the advantages accruing therefrom are not fully realised. Of course, there are difficulties to be contended with, as a large proportion of our permanent grazing lands consist of hilly and rough country. The fact remains, however, that land which has been cropped and manured and the next year left to grass grows considerably more feed than land that has not been manured; and if such results are obtained where the fertilising constituents of the manures applied have been previously drawn upon by an exacting crop such as wheat, it can be easily understood that when applied direct to grass lands, and more especially permanent pasture, the difference is even more marked.

Arrangements were made last season with Mr. J. O'Shanahan, of Tod River, Port Lincoln, and Mr. S. H. Schinckel, of Naracoorte, to carry out a series of experiments, the scheme of which is as follows:—

Plot 1.—No manure.

2. 2cwt. mineral super., 1cwt. nitrate of soda, 1cwt. sulphate of potash.
- 3.—2cwt. mineral super., 1cwt. nitrate of soda.
- 4.—2cwt. mineral super., 1cwt. sulphate of potash.
- 5.—1cwt. nitrate of soda.
- 6.—1cwt. sulphate of potash.
- 7.—2cwt. mineral super.

In every case the manured plots showed an improvement over the unmanured check plot. The complete dressing of mineral super., nitrate of soda, and sulphate of potash (plot 2) gave the best results, but plot 7 (mineral super. only) also showed up satisfactorily, and the difference in appearance between the two plots would certainly not warrant the expenditure in applying the nitrate of soda and sulphate of potash in addition to the mineral super.

THE WHEAT MARKET.

There was but little variation in the price of wheat in South Australia during the month of March. From the middle of the month, however, there was a gradual rise from 3s. 11½d. to 4s. 1½d. As has been the case for several months, there is only a small disparity in the prices prevailing in the various Australian States.

Beerbohm's Evening Corn Trade List comments as follows on the wheat market :—“ There was a steadier tone in the market in the early part of this week, with a better inquiry, and distinctly less pressure to sell on the part of holders ; some 15 to 20 cargoes changed hands, but there was little or no improvement in prices. Since two days ago the feeling has become much quieter, the demand apparently being satisfied for the time being. Plate wheats, in view of expected much larger Argentine shipments this week, were freely offered at less money, without attracting buyers. Last week’s shipments were more than equal to requirements, and there are no signs at present of any material falling off in exports. The imports of wheat and flour in the first six months of the season have been liberal, amounting to 13,900,000 quarters, against 11,850,000qrs. last season, but from the excess in imports has to be deducted the falling off of farmers’ deliveries of 850,000qrs., leaving a net increase of 1,200,000qrs. In February, however, the imports were below our requirements, and stocks in first hands have decreased on the month about 100,000qrs., the total of 1,750,000qrs., although quite a moderate one, being 500,000qrs. larger than last year’s small quantity. The world’s visible supply of wheat shows that the increase on the month has amounted to only 785,000qrs., against an increase last year of 1,200,000qrs., and in 1908 of 1,300,000qrs. On the other hand it is known that there is much more wheat left over from the world’s crop of 1909 than from that of 1908, and it would appear to principally depend on how the growing crops come through the winter, as to what level of prices farmers will be disposed to part with their remaining surplus. The Washington Agricultural Bureau will, in a few days, issue its report on the amount of wheat in farmers’ hands on March 1st ; if the official estimate of the last crop was correct, the quantity ought to be very much larger than in 1909. The American markets have been distinctly weak during the last few days, principally owing to more favorable crop and weather news.” According to the same journal the reports of the wheat yield in Argentina still continue to be disappointing, and the estimates have been further reduced.

Date.	LONDON (Previous Day).		ADELAIDE.		MELBOURNE.		SYDNEY.	
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.
Mar. 7	—	..	..	..	3/11 $\frac{1}{4}$ to 4/-	4/0 $\frac{1}{2}$ to 4/1	..	..
8	Dull and neglected	..	..	..	3/11 to 4/-	4/0 $\frac{1}{2}$	..	4/0 $\frac{1}{2}$ b.; 4/1 s.
9	Jan. 4/8 $\frac{3}{4}$; Dee. 4/9 (steamer) ..	..	..	Do.	..	Do.	..	4/- b.; 4 $\frac{1}{2}$ s.
10	Very dull	..	..	Do.	..	4/- to 4/0 $\frac{1}{2}$	..	3/11 $\frac{1}{2}$ to 4/- b.; 4/0 $\frac{1}{2}$ s.
11	Dull	..	..	3/11 to 3/1 $\frac{1}{2}$ ..	..	..	..	3/11 $\frac{1}{2}$ b.; 4/1 s.
12	Jan. 4/10 $\frac{1}{2}$	..	..	3/10 $\frac{1}{2}$ to 3/1 $\frac{1}{2}$	..	4/- to 4/0 $\frac{1}{2}$	..	4/- to 4/0 $\frac{1}{2}$ b.; 4/1 s.
14	—	..	..	3/11 $\frac{1}{2}$ to 4/-	..	Do.	..	Do.
15	Steady	..	..	Do.	..	4/0 $\frac{1}{2}$ to 4/1	..	Do.
16	March 4/10 $\frac{1}{2}$ (steamer) ..	..	..	Do.	..	4/1 ..	..	Do.
17	Steady	..	..	Do.	..	Do.	..	4/0 $\frac{1}{2}$ to 4/1 b.; 4/1 s.
18	March 4/10 $\frac{1}{2}$ (steamer) ..	..	..	Do.	..	Do.	..	4/1 to 4/1 $\frac{1}{2}$; 4/1 to 4/2 s.
19	Afloat 4/10 $\frac{1}{2}$; March 4/16 $\frac{3}{4}$	..	..	Do.	..	Do.	..	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
21	—	..	..	4/- to 4/0 $\frac{1}{2}$	..	4/1 to 4/2	..	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
22	Quiet	..	..	Do.	..	4/1 to 4/2	..	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
23	Dull	..	..	Do.	..	4/1 to 4/1 $\frac{1}{2}$	..	4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
24	4/9; 4/9 $\frac{3}{4}$ (afloat)	..	..	Do.	..	—	..	—
25	—	..	..	Do.	..	—	..	—
26	—	..	..	Do.	..	—	..	—
28	—	..	..	4/0 $\frac{1}{2}$ to 4/1	..	4/1 to 4/1 $\frac{1}{2}$	..	4/- to 4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
29	Feb. 4/10 $\frac{1}{2}$ (steamer) ..	..	..	Do.	..	Do.	..	4/0 $\frac{1}{2}$ to 4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
30	4/10 $\frac{7}{8}$ (off coast) ..	..	..	Do.	..	Do.	..	4/0 $\frac{1}{2}$ to 4/1 b.; 4/1 $\frac{1}{2}$ to 4/2 s.
31	4/11 (off coast); April 4/9 $\frac{3}{4}$ (steamer) ..	..	..	4/1 to 4/1 $\frac{1}{2}$	..	4/2	..	4/1 to 4/1 $\frac{3}{4}$ b.
Appl. 1	—	..	..	Do.	..	4/2 to 4/2 $\frac{1}{2}$	..	4/1 to 4/1 $\frac{3}{4}$ b.
2	March 4/10 $\frac{7}{8}$ ..	..	..	Do.	..	4/2 $\frac{1}{2}$	..	Do.
4	—	..	..	Do.	..	4/1 to 4/1 $\frac{1}{2}$	..	..
5	4/10 $\frac{7}{8}$ afloat	..	..	Do.	..	4/1 to 4/1 $\frac{1}{2}$	..	..

STEAMER FREIGHTS.—Parcels, Port Adelaide to London or Liverpool, 21s. 3d. per ton (6 $\frac{2}{3}$ d. per bushel). Full cargoes, Australia to United Kingdom.—Continent, 21s. per ton (6 $\frac{2}{3}$ d. per bushel); Port Adelaide to Melbourne, 10s. per ton (3 $\frac{1}{2}$ d. per bushel); Port Adelaide to Sydney, 13s. per ton (4 $\frac{1}{3}$ d. per bushel).

SAILOR FREIGHTS.—A little business was done at 21s. 3d. per ton (6 $\frac{2}{3}$ d. per bushel) to United Kingdom—Continent; South Australasia to South Africa, 18s. per ton (5 $\frac{1}{3}$ d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for March, 1910, at the undermentioned stations, also the average total rainfall for the first three months in the year, and the total for the three months of 1910 and 1909 respectively :—

Station.	For March, 1910.	Av'ge. to end March.	To end March, 1910.	To end March, 1909.	Station.	For March, 1910.	Av'ge. to end March.	To end March, 1910.	To end March, 1909.
Adelaide	4.10	2.52	4.18	1.62	Hamley Bridge	4.76	2.20	5.11	1.80
Hawker	3.39	1.59	3.92	1.04	Kapunda....	4.76	2.52	5.46	2.49
Cradock	2.37	1.78	3.73	0.69	Freeling	4.93	2.17	5.40	2.12
Wilson	2.68	1.74	4.71	0.75	Stockwell	3.76	2.15	4.49	1.94
Gordon	1.98	1.76	2.78	0.36	Nuriootpa....	4.06	2.35	4.55	2.10
Quorn	1.92	1.64	2.59	0.35	Angaston	4.18	2.29	5.26	2.40
Port Augusta.	1.74	1.75	2.55	0.76	Tanunda	3.38	2.59	3.96	2.27
Port Germein	3.50	1.73	3.84	1.14	Lyndoch	3.17	2.29	3.79	1.88
Port Pirie ..	4.88	1.77	5.25	0.71	Mallala	4.01	2.18	4.12	1.46
Crystal Brook	3.14	1.81	4.38	1.18	Roseworthy ..	3.67	2.11	5.87	2.03
Pt. Broughton	2.93	1.79	3.21	1.32	Gawler.....	3.48	2.40	4.33	1.60
Bute	2.80	1.74	3.40	1.25	Smithfield ..	5.12	2.41	5.27	1.35
Hammond ..	2.55	1.70	4.05	0.54	Two Wells....	3.50	2.12	3.53	1.33
Bruce	1.88	1.67	2.97	0.30	Virginia	4.18	2.22	4.18	1.16
Wilmington .	4.74	1.97	5.54	0.74	Salisbury....	4.26	2.35	4.80	1.35
Melrose	8.54	3.09	9.42	1.14	Teatree Gully ..	4.42	3.38	4.56	2.59
Booleroo Cntr	3.67	1.95	4.92	0.60	Magil'	3.47	2.97	3.60	2.07
Wirrabara....	6.30	2.13	6.95	1.19	Mitcham	3.70	2.44	3.75	1.84
Appila	4.65	2.18	7.10	0.93	Crafers....	7.04	4.39	7.39	4.32
Laura	5.00	2.09	7.10	1.15	Clarendon ..	4.10	3.61	4.19	2.60
Caltowie	3.47	2.14	5.09	0.87	Morphett Vale	3.52	2.74	3.57	1.69
Jamestown ..	2.74	2.16	3.32	0.69	Noarlunga....	2.57	2.32	2.65	1.48
Gladstone ..	3.67	1.88	4.45	0.83	Willunga....	4.28	2.75	4.37	2.25
Georgetown ..	2.85	2.25	3.40	0.91	Aldinga....	2.58	2.62	2.63	1.47
Narridy	2.77	2.15	3.23	0.84	Normanville ..	3.83	2.13	3.83	1.52
Redhill	4.17	1.85	4.21	1.04	Yankalilla....	6.19	2.43	6.19	1.02
Koolunga....	3.92	1.98	4.09	0.93	Eudunda....	5.60	1.95	8.13	1.31
Carrieton....	2.49	1.72	6.99	0.43	Sutherlands ..	3.76	—	4.73	0.67
Eurelia	2.60	1.79	5.41	0.52	Truro.....	3.94	2.14	4.30	2.05
Johnsbury ..	2.23	1.41	4.72	0.49	Palmer	4.82	—	5.16	1.27
Orroroo	2.61	2.33	4.91	0.51	Mt. Pleasant ..	4.09	2.72	4.42	1.82
Black Rock..	3.07	2.00	5.73	0.52	Blumberg ..	4.08	3.09	4.82	2.13
Petersburg ..	2.43	2.06	4.07	0.95	Gumeracha ..	4.19	3.21	5.16	2.91
Yongala	2.98	1.86	4.48	0.50	Lobethal....	4.71	3.18	5.10	3.10
Terowie	2.31	2.00	7.89	0.62	Woodside	5.84	3.02	6.28	2.66
Yarcowie....	2.18	1.98	6.80	0.71	Hahndorf ..	6.32	3.33	6.96	2.50
Hallett	3.02	1.95	4.37	0.78	Nairne....	7.90	3.20	8.12	2.48
Mount Bryan	3.23	1.79	5.27	0.64	Mt. Barker ..	6.85	3.30	7.77	2.30
Burra	4.07	2.35	6.40	2.41	Echunga....	8.46	3.30	8.64	3.24
Snowtown....	3.94	1.82	4.05	1.28	Macclesfield ..	8.64	2.96	8.96	2.90
Brinkworth..	4.50	1.96	4.63	0.96	Meadows....	8.02	3.67	8.40	3.53
Blyth.....	3.48	1.98	3.59	1.72	Strathalbyn ..	6.73	2.40	7.00	2.03
Clare	6.17	2.75	6.38	1.92	Callington ..	5.40	2.18	5.48	1.48
Mintaro Cnrtl.	6.25	2.12	6.36	1.39	Langh'rne's B	4.26	1.94	4.48	1.55
Watervale ..	6.49	2.65	6.81	2.39	Milang.....	3.02	2.16	3.14	1.51
Auburn	6.30	2.96	7.01	2.70	Wallaroo....	1.84	1.83	1.97	1.37
Manoora	4.83	1.92	6.09	1.32	Kadina	1.79	1.88	1.91	1.06
Hoyleton....	3.67	2.20	3.67	1.56	Moonta....	1.58	1.87	1.70	1.06
Balaklava ..	3.90	2.01	3.93	1.25	Green's Plns.	2.34	1.57	2.34	1.04
Pt. Wakefield	2.81	2.12	3.07	0.96	Maitland....	2.41	2.00	2.41	1.74
Saddleworth ..	5.00	2.53	6.17	1.56	Ardrossan ..	2.04	1.62	2.04	1.19
Marrabel ...	5.83	2.10	5.94	1.75	Port Victoria ..	1.72	1.56	1.73	1.13
Riverton....	6.25	2.41	7.18	2.06	Curramulka ..	2.77	2.01	2.78	1.39
Tarlee	5.07	2.16	5.88	2.20	Minlaton....	2.28	1.74	2.82	1.18
Stockport ...	4.46	2.11	4.67	1.39	Stansbury....	3.24	1.81	3.26	1.18

RAINFALL TABLE—*continued.*

Station.	For March, 1910.	Av'ge to end March.	To end March, 1910.	To end March, 1909.	Station.	For March, 1910.	Av'ge to end March.	To end March, 1910.	To end March, 1909.
Warooka....	1.84	1.58	1.92	0.92	Bordertown .	3.79	2.17	3.95	1.47
Yorketown .	3.13	1.63	3.25	1.32	Wolseley....	4.26	1.82	4.42	1.50
Edithburgh..	2.88	1.85	3.67	1.52	Frances.....	3.93	2.18	4.27	1.85
Fowler's Bay.	0.23	1.40	0.28	0.59	Naracoorte .	4.72	2.53	4.97	2.24
Streaky Bay.	0.12	1.63	0.12	0.67	Lucindale ...	4.81	2.36	5.30	2.39
Port Ellioton.	0.26	1.41	0.34	1.10	Penola	4.91	3.20	5.92	2.96
Port Lincoln.	0.75	2.07	0.80	1.80	Millicent	2.96	3.31	3.78	3.19
Cowell	3.38	1.66	3.56	1.24	Mt. Gambier.	3.26	4.02	4.70	4.65
Queenscliffe .	4.21	1.72	4.46	1.34	Wellington ..	5.20	2.21	5.22	1.56
Port Elliot ..	3.54	2.48	3.71	1.71	Murray Bridge	6.66	2.07	6.73	1.32
Goolwa	3.33	2.31	3.46	2.01	Mannum ...	5.39	1.79	5.72	1.43
Meningie....	3.09	2.21	3.24	1.91	Morgan	2.59	1.47	3.37	0.74
Kingston....	3.70	2.45	3.77	1.86	Overland Crnr	5.51	1.96	6.06	0.45
Robe	3.44	2.53	3.62	2.07	Renmark....	4.03	1.73	4.68	0.96
Beachport...	1.84	3.06	2.40	2.92	Lameroo ...	4.07	—	4.15	2.47
Coonalpyn ..	3.90	2.05	4.17	1.76					

DAIRY AND FARM PRODUCE MARKETS.

The Manager of the Produce Export Department reports on April 7th—

EGGS.

After the severe heat in February, the month of March market opened at 1s. per dozen for good, reliable consignments, and steadily increased to 1s. 4d. per dozen by the end of the month. Graded circle eggs, owing to seasonable Easter inquiry both for local and inter-State trade, found ready sale up to 1s. 5d. per dozen. The growing popularity of the grading system is evidenced by the active demand being experienced for South Australian graded eggs in the Sydney and Melbourne market.

BUTTER.

There was a very good supply of cream during March, in spite of the heat wave experienced, and it compares very favorably with the corresponding period of last year. The butter produced has been up to its usual standard, and the demand has been great. The prices firmed during the month, present prices being—Superfine, 1s. 3d. per pound; pure creamery, 1s. 2d. per pound.

Messrs. A. W. Sandford & Co. report on April 1st:—

FLOUR.—City brands, £10; country, £9 10s., per ton of 2,000lbs.

BRAN.—1s. 0½d.

POLLARD.—1s. 1½d. per bushel of 20lbs.

OATS.—Local Algerians, 2s. per bushel of 40lbs.

BARLEY.—Cape, for seed, 2s. 6d. per bushel of 50lbs.

CHAFF.—£3 5s. f.o.b., Port Adelaide, per ton of 2,240lbs.

POTATOES.—Locals, £6; Gambiers, £5 5s. to £5 10s., on trucks, Adelaide or Port, per ton of 2,240lbs.

ONIONS.—Locals, £3 10s.; Gambiers, £3 5s. to £3 10s. on trucks, Adelaide or Port, per ton of 2,240lbs.

BUTTER.—Factory and best creamery, fresh in prints, 1s. 2d. to 1s. 3d.; choice separators, dairies, 1s. 1d. to 1s. 2d.; weather-affected factory and creamery, 9½d. to 10d.; stores and collectors, 8d. to 9d., per lb.

CHEESE.—Factory makes, 5½d. to 6½d. per lb.

BACON.—Factory-cured sides, 9d. to 9½d. per lb.

HAMS.—In calico, 10d. per lb.

EGGS.—Loose, 1s. 4d. per dozen.

LARD.—Skins, 7d.; tins or bulk cases, 6½d. per lb.

HONEY.—Prime clear extracted, 3d. per lb.; off-flavored, 1½d. per lb.; beeswax, 1s. 1½d.

ALMONDS.—Soft shells, Brandis, 7d.; mixed soft shells, 6d.; kernels, 1s. 4d. per lb.

LIVE POULTRY.—Good table roosters, 2s. 9d. to 3s. each; light cockerels, 1s. 6d. to 2s.; hens, 1s. 3d. to 1s. 8d.; ducks, 1s. 6d. to 2s. 6d.; geese, 3s. to 4s.; pigeons, 6d.; turkeys, from 6½d. to 9½d. per lb. live weight, for fair to good table sorts.

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		April.	May.			April.	May.
Amyton	*	—	—	Meningie	†	23	21
Angaston	787	23	21	Merghiny	793	7	5
Appila-Yarrowie	*	—	—	Millicent	*	12	10
Arden Vale & Wyacca	*	—	—	Miltalie	794	2	21
Arthurton	791	—	—	Minlaton	*	24	28
Balaklava	789	9	14	Mitchell	794	23	21
Beetaloo Valley	785	—	—	Moonta	792	—	—
Belalie North	*	23	21	Morchart	784	—	—
Bowhill	*	—	—	Morgan	†	23	—
Brinkworth	786	19	24	Morphett Vale	*	—	—
Bute	*	19	—	Mount Bryan	*	—	—
Butler	793	—	—	Mount Bryan East	†	2	7
Caltowie	*	18	23	Mount Gambier	803	9	—
Carrieton	*	21	19	Mount Pleasant	*	8	13
Cherry Gardens	798	19	24	Mount Remarkable	†	21	19
Clare	†	22	20	Mundoora	*	—	—
Clarendon	*	18	23	Nantawarra	790	20	18
Colton	*	23	21	Naracoorte	†	9	14
Coomooroo	784	26	23	Narridy	786	—	—
Coonalpyn	†	—	—	Northfield	*	19	24
Cradock	*	—	—	Orroroo	*	—	—
Crystal Brook	*	—	—	Parrakie	797	2	7
Cummins	*	23	21	Paskeville	†	23	21
Davenport	†	—	—	Penola	804	9	14
Dawson	*	—	—	Penong	†	9	14
Dingabledinga	*	8	13	Petina	*	16	21
Dowlingville	*	—	—	Pine Forest	†	19	24
Forest Range	*	21	19	Port Broughton	*	22	20
Forster	*	16	14	Port Elliot	799	16	21
Fowler Bay	*	23	21	Port Germein	*	—	—
Frances	800	22,	20	Port Pirie	*	9	17
Freeling	*	—	—	Quorn	*	23	—
Gawler River	*	—	—	Redhill	†	16	21
Georgetown	*	23	21	Renmark	*	—	—
Geranium	*	30	28	Rhine Villa	797	—	—
Golden Grove	†	21	19	Riverton	*	23	21
Goode	*	—	—	Saddleworth	*	15	20
Green Patch	*	18	23	Salisbury	791	5	3
Gumeracha	*	18	23	Shannon	794	—	—
Hartley	798	23	—	Sherlock	*	—	—
Hawker	*	22	20	Smoky Bay	*	—	—
Hookina	*	23	—	Stansbury	*	—	—
Inkerman	*	21	19	Stockport	*	—	—
Johnsburg	†	24	—	Strathalbyn	†	18	16
Kadina	792	21	19	Sutherlands	797	23	21
Kalangadoo	801	9	14	Tatiara	804	—	—
Kammantoo	*	22	20	Uraidla and Summert'n	*	4	2
Keith	†	—	—	Utera Plains	†	23	21
Kingscote	*	5	3	Virginia	*	—	—
Kingston	*	5	28	Waikerie	*	—	—
Koolunga	*	19	24	Watervale	*	—	—
Koppio	793	—	—	Wepowie	*	—	—
Kybybolite	802	21	19	Whyte-Yarcowie	787	—	—
Lameroo	796	—	—	Wild Horse Plains	*	—	—
Lipson	*	—	—	Willunga	*	2	7
Longwood	798	20	18	Wilkawatt	*	—	—
Lucindale	†	2	—	Wilmington	†	21	19
Lyndoch	799	21	19	Wirrbara	785	—	—
Maitland	*	2	7	Woodside	*	—	—
Mallala	*	4	2	Yallunda	*	—	—
Mannum	*	30	28	Yongala Vale	†	16	21
Meadows	*	—	—	Yorketown	*	9	14

* No report received during the month of March.

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD.)

Coomooroo, March 21.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Berryman (chair), Brice, W. J. and A. Robertson, White, Hall, and Kildea (Hon. Sec.).

CARE OF HORSES.—Mr. A. Robertson read a paper on this subject. In view of the value and importance of their horse stock, the question of feeding requires great attention. Working horses should never be turned out in the paddocks to forage for themselves, and a good stable was therefore necessary, so that they can be kept in all the year round. On the farm the chief food should be hay chaff and oats. Where wheat or cocky chaff is used it should be damped, and a liberal allowance of bran added. A good feed for three horses would be one bag wheat chaff, 3galls. of bran, and 3galls. of crushed oats. If hay chaff and molasses are used the bran can be reduced one-half. In the busy season the team should have two hours to feed before being taken out to work, and at dinner time one and a half hours should be allowed. Give a course of reliable condition powders occasionally to keep the horses in healthy condition. The collars should be well fitting, in order to prevent galling. Where the horses are called upon to do heavy pulling the collars must be seen to, and should not be put on damp. The teeth should be looked after: slobbering is a certain indication that something is wrong. A tooth may be loose, and there may be a sharp point causing irritation. When breaking in young horses they should always be firmly but gently handled; he would break them in when about two and a half years old, only giving them light work for the first year. Some discussion followed on the use of molasses. Mr. Hall said he knew of horses which had been fed on molasses for years without ill effect, while Mr. Berryman mentioned that the large carrying firm of Hill & Co., who had used molasses with other feeds for years for their horses, had contradicted the statement that it had an injurious effect on the animals. Mr. Hall considered change of feed occasionally necessary, and would therefore turn the horses out on pasture for a time, but it was pointed out that horses stabled fed for years practically without any change kept in good health, but if turned out for a time on to green feed they looked for it afterwards when stabled. It was agreed that sore shoulders were usually caused by use of too large collars, and lack of cleansing of the shoulders and collars before harnessing up. Bathing with salt and water was recommended for scalds, while Mr. Hall advised members to cut holes in the collars to avoid pressure on sores.

VERMIN DESTRUCTION.—Some discussion on this subject took place, and it was agreed that in this district trapping was better than poisoning, and that as the rabbits were breeding now, the work should be taken in hand at once. S.A.P. was considered preferable to strichnine for poisoning, being less dangerous to stock. Mr. Berryman advised thoroughly digging out the burrows where these were not too numerous. The destruction of foxes was strongly recommended, on account of their depredation in the poultry yard and amongst the lambs.

Morchard, February 19.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Scriven (chair), Kupke, Kitto, Reichstein, Jasper, Peak, Toop, Parsons, Okley (acting Sec.), and one visitor.

IMPRESSIONS OF PINNAROO COUNTRY.—Mr. Okley read a paper giving his impressions of the Pinnaroo country, which he had recently visited. The mallee scrub varied in height from 3ft. to 30ft., according to the country it was growing in. Nearly all the plants that were to be seen in the scrub to the north-east of Petersburg were found growing in this district. They seemed to be more highly developed, probably owing to the more

congenial climatic conditions. Other plants new to the writer were also seen. In all parts belts of pine were found, which served for fencing purposes. The method of rolling and burning scrub was then described, and the great danger of bush fires touched upon, and an extract from the *Register* read upon that difficulty. It was mentioned that if a fire passed through a standing scrub it was a very difficult matter indeed to clear it, and those who were buying land should look out for this. Stumps worked out in three ploughings, and were then heaped up and burned. The necessary shoot-cutting entailed much labor, and those who did this work sometimes earned as much as 15s. per day. The sandy nature of the country made it possible to work the soil almost at any time. The sand was only bad in patches on rises and low hills. Although called sandhills, he thought the name misleading, as in many cases a little below the surface limestone or clay was found. He then mentioned that a settler from Petersburg had taken up a block in country called Piccaninny Sandhills. This season a crop of 500 acres had yielded from 16bush. to 18bush. per acre, and most of the area had been cropped once before. A modern dwelling was now being erected on this farm. The paper then dealt with the question of roads. The sand in wet weather was hard and the clay soft and sticky. In the summer time the clay made a good surface, while the sandy places made very heavy pulling indeed. It was hardly possible in this country to construct dams, but good water could be procured by boring from 150ft. to 200ft. deep. Stock did well on the natural grasses, of which there were various kinds. Horses sometimes suffered from "sand," but this could be got away by administering simple and tried remedies.

Wirrabara, February 19.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. P. Lawson, (chair) Hoskins, Blesing, Curnow, W., W. H., and E. J. Stevens, C., J., and E. Hollitt, H. E., A., and G. Woodlands, Kendrick, and H. Lawson (Hon. Sec.)

PREPARING LAND FOR WHEAT-GROWING.—Mr. Hoskins read the following paper on this subject:—"Fallowing should commence as soon as seeding is finished, and should be completed by the end of September. This done, the harrows should be started to break down the fallow. I have noticed that a good many farmers do not trouble about harrowing the fallow, but just run the cultivator over it, the result being a paddock of clods. If the fallow is harrowed after being ploughed, it will be smooth, and the weeds will grow quickly and then by going over it with the cultivator most of the weeds can be killed. I will go so far as to say that farmers cannot work fallow in this district too much. If stony land has to be dealt with there should be a time set apart to cart off the stones, as you are all well aware that stones play havoc with all farm implements, especially the binder and harvester. Stinkwort has become a nuisance to some farmers, but if they worked the soil as I have mentioned there would be little or no trouble with this weed. I am not in favor of ploughing the fallow after harvest, but prefer to wait until a good shower of rain falls before starting seeding operations. Putting the seed in dry ground is very risky."

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, February 21.

PRESENT.—Messrs. Fradd (chair), A. and F. Bartrum, Woolford, Murphy (Hon. Sec.), and one visitor.

UTILISATION OF THE LAND.—Mr. Woolford read a short paper on the better use of the land. In this district land had yielded up to 25bush. of wheat per acre, and this at 4s. per bushel gave a return of £5 per acre. On large areas they could hardly ask for better

returns than this. He thought they might grow oats successfully after wheat. In small areas gardens and green feed gave splendid returns, but, generally speaking, fruit-growing and farming do not work in well together. More sheep might be kept with advantage in this district, as the feed was good. Waste lands should be planted to sugar gum or red gum, which in the course of a few years would become a valuable asset on the farm. Members were generally agreed that by intense culture and rotation of crops better use could be made of much of the land in this district. Peas were strongly recommended for a change. Mr. Fradd mentioned that he had a small paddock about half of which was black soil and half limestone land. This was sown with Federation wheat 1bush. and mineral super. 60lbs. per acre. The black soil yielded 30bush., and the limestone land only 6bush. He had had similar results previously, and although different brands of super. had been used he could see no benefit on the limestone land. Members would like to know the cause of this. [It is not possible, without careful investigation, to suggest the cause of the non-effect of super. Generally speaking, mineral super. has given most satisfactory results on soils containing a fair amount of lime. Is the ground shallow, with fairly solid limestone crust beneath, or is it rubbly limestone?—Ed.]

Brinkworth, March 22.

(Average annual rainfall, 14½in.)

PRESENT.—Messrs. Davis (chair), Hawker, Stott, Nettle, Wood, Rowe, and Hill (Hon. Sec.).

BEST WHEATS.—Members reported on harvest results, and discussion ensued. Federation wheat was generally regarded as the best variety for this district, as it stood the dry weather and yielded well.

PICKLING SEED WHEAT.—Discussion on this subject took place. Mr. Hawker stated that last season he used a 1 per cent. solution of bluestone (1lb. to 10galls. of water), and pickled in a large trough. The seed was spread in the trough, and the pickle sprinkled over it, the seed being turned several times during the operation. Although sown during some of the wettest weather the seed germinated well, and he had very little smut in the crop. He did not believe in dipping the wheat in a barrel, as some of it was too heavily pickled, while some in the middle of the bag was practically untreated. Mr. Davis reported having tried formalin with very unsatisfactory results—only about one-third of the wheat germinating. [What strength pickle was used, how soon after pickling was the seed sown, and what was the condition of the soil as to moisture? Points like these, which have a direct bearing on the success or failure of the treatment, should always be noted in the reports.—Ed.] Members were agreed that best results were obtained when the seed was pickled from day to day, as required.

Narridy, March 26.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Satchell (chair), Darley, Nicholson, Freebairn, Black, Smart, and Kelly (Hon. Sec.).

TAKEALL.—Some discussion took place on references by Professor Perkins, in College harvest report, to losses from takeall. Members considered that a great deal of the so-called takeall referred to by Professor Perkins was blighting and whiteheads, and not takeall fungus at all.

WORKING FALLOW.—Mr. Smart inquired whether it was advisable to scurfy the fallow at this time of the year. Members were of opinion that, provided the surface was left fine and the land not worked too deeply, no injury would result.

LONDON PRICES OF WHEAT.—A clipping from the Melbourne *Leader*, dealing with wheat prices cabled from London, was read. The contention of the writer was that while on a given date the *Mark Lane Express* of London quoted ruling prices of Australian wheat at 48s. per quarter, the quotations published in the Australian papers were 39s. to 39s. 9d. per quarter. If the English figures were correct they were equivalent to 5s. 7½d. per bushel, whereas the figures published in Australia were equivalent to 4s. 11½d.—a difference of 8d. to 9d. per bushel. Members resolved to ask the Department of Agriculture for information on the subject.

Whyte-Yarcowie, February 29.

(Average annual rainfall, 18½in.)

PRESENT.—Messrs. Pearce (chair), Jenkins, McCann, McLeod, A. and F. Mitchell, Ward, Hunt, G. R. and G. D. Mudge, M. and J. Walsh, Lock (Hon. Sec.), and one visitor.

HARVEST REPORTS.—General satisfaction with the harvest returns was expressed, and although the returns—owing, mainly, to more scientific culture and better wheats—are now almost as many bags as they used to be bushels, yet members realise that there is much more to be done to get the best out of the land, and to this end almost everyone is experimenting in some way or other to increase the yield of wheat and feed. Federation—although not so noticeable as the previous year—proved itself a very reliable and prolific wheat, whilst Yandilla King, Silver King, and Dart's Imperial were high in favor. Very little land is sown two years in succession, fallow being looked upon as the only sure method of obtaining a good return; but one member reported 16bush. reaped off land cropped the third year. This, although falling a good bit short of the fallowed ground, was considered very satisfactory. Some members reported considerable damage to standing crops by storm and flood which occurred early in January, but, fortunately, the area of storm was not great.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Angaston, February 26.

(Average annual rainfall, 21½in.)

PRESENT.—Messrs. Stephens (chair), Friend, Player, Walters, Sibly, Ball, Smith, Wishart, Salter, Matthews (Hon. Sec.), and seven visitors.

DYING ZANTE CURRANTS.—The Chairman read a paper on this subject, as follows:—“This subject has suggested itself on account of a comparison, drawn by a merchant, between currants produced in this district and those of Renmark:—“The first thing to be attended to is the spreading of the trays for the day's picking. Keep each day's picking together, as much time will be saved, when they are ready for turning. Picking.—Do not attempt any picking after rain, but wait until the berries have quite dried off before putting the pickers on. Instruct pickers to be very careful not to crush the fruit and not to jam it down in the buckets. Where the distance is not great it is preferable to collect the buckets straight into the cart or van and take them to the drying ground, and thence on to the trays. A tray 5 x 2 should hold one tin and a half or about 30lbs. of fresh fruit. This plan is advocated as against the carting in cases, for careless pickers will dump the fruit into the cases, damaging the tender berries and causing the stickiness found in some samples. In a late season like the present one it is often necessary to go over the vines twice or even three times. Fruit ripens earliest at the extremity or extension rods, and this should be picked first. When the cart arrives at the drying ground have a couple of boys to receive the fruit, and also to hand up the empty buckets, which should be ready. Thus three sets of buckets are required, as the pickers will have an empty set in the vineyard. The two boys then set to work and spread the fruit and have the buckets empty and ready on return. Drying.—When the first day's picking has been out for about three or four days, and the berries start to wrinkle and the stems have lost their green appearance and taken on a brown hue, it is time to turn them. This is a very simple operation, and any boy can be taught it in a few minutes. After placing an empty tray on top of the tray to be turned place the left hand under the right on top of the two trays, a mate doing the opposite—that is, his left on top and right under—and at the word “Two” give the tray a sharp turn and the trick is done. The handiest tray for this is one with sides and ends the same height (1½in.) and three cleats on the bottom to allow free circulation when stacked. Next comes the rubbing off. It would be foolish to state how long the fruit should be left before this is done, as the weather conditions have all to do with it, and the operator must use his own judgment. They should be tried about 3 or 4 o'clock in the afternoon. Do not attempt any rubbing off in the mornings, as the stems are then tough and the berries will not readily leave them. From about 3 to 6, when they begin to cool off, is the correct

time. When rubbed off they may be "double banked" and about one good day's sun shine would finish them. It is often very difficult to tell if currants are properly dried, when they are still heated on the trays, and a very good plan is to go through at about 5 o'clock and stack all that are doubtful in the opposite direction until morning, when it is very much easier to tell. When taken in the hand and squeezed and released they should fall apart fairly freely and have an elastic tendency. Sweating.—This is the most important part of all. An ideal place for sweating is a cool, dry building, and it is very important that the heap or heaps do not come in contact with any moisture whatever. A cement floor would be quite safe providing it were not under the ground level and not likely to draw any moisture, but a good wooden floor is best. Some growers sweat their entire crop in one large heap. This, I think, is a great mistake; 1-ton lots are better handled, and should anything happen to go wrong it can easily be detected and remedied. It is possible to plunge the arm almost to the bottom of these smaller lots and get out a handful, and examine them from day to day as the sweating is going on. Should there be any claminess or dampness near the bottom, lose no time in getting the heap on trays and out in the sunshine. If proper care be taken, however, this should never happen. When the currants are ready to go on to the sweating heap, they will still have the bucks in them, and these, of course, must be removed, as they are only partly dry, and if put on to the heap with the others would perhaps cause the whole heap to ferment. Have the winnower ready and put them through, thus separating the bucks from the good currants. Place a tray under the shoot to catch the bucks, and when filled another on top of that until there are five or six trays full; then take them out and spread them. On no account must the currants be put on the "sweating" heap while heated. This is probably the cause of most of the dampness that is so dreaded. The currants should be left from 14 to 20 days before being cleaned up and bagged. A very good way to sweat on a small scale is, when the fruit is dried and bucks removed, to heap on a tray, say 40lbs. or 50lbs., and stack in a cool dry place for about 20 days. Should any trays have been overlooked and so over-dried do not empty on to your heap with a view of putting some under-dried on next. This may mean the spoiling of the lot. Rather mix them together on a single tray pretty thickly and put them on one side, and it will be found that they will come back all right in a day or two. It is said that some growers in this district are going to try wire-netting trays this season. I wish them every success, but think they should try drying in the shade on a small scale in a climate such as ours before going in for many of these trays. Most of the growers hail with delight every bit of sunshine and take advantage of it. Red Berries.—These, like the poor, we always have, and it is a very good plan after the currants have been spread for about two or three days to send a boy through with a bucket to pick off any bunches that are red. Some bunches on immature wood will never get black, and of course in they go with the others when the pickers come to them. Winnower.—It is wise to have the winnower on a slightly raised platform; this prevents the currants from blocking and allows them to run into a shallow wooden trough (that is if they have been dried and sweated well—nothing will make some sticky) holding about 80lbs. to 100lbs. This trough should be fitted with strong handles at either end, and is useful in many ways. Plain, light, galvanized troughs would, I think, answer the purpose even better. It would be essential to have them made over the full width of the trays so as to run the dry currants into them. The time is near at hand when we shall have to lay aside the old winnower (except perhaps for cleaning out the bucks) and go in for the more modern cleaner and grader. These do not appear to have quite reached perfection yet, but no doubt when the growers begin to inquire the manufacturers will pay more attention to perfecting a good, quick, working article at a reasonable figure. In conclusion I would like to say the main thing in getting a good sample of dried fruit is, first of all, getting a good sample of fresh fruit, and this can only be done by good cultivation and good pruning. Of course soil plays an important part, but it is not always the man with the best soil who turns out the best article." A general discussion followed. Mr. S. O. Smith did not agree with the idea of double banking; he found it best to rub off as soon as the currants were ready for the winnower. For cleaning out the bucks he used a screen 6ft. long by 2ft. 8in. wide with square mesh; this brought out the bucks and large stems and made winnowing much more simple, enabling bucks to be out drying at once. His experience had been that the fruit sweated better in big heaps. Red berries he thought to be due to exposure to the sun; those bunches under dense foliage he found to be dense black. He is trying 200 wire-netting trays this season. Mr. Fulton Salter believed in letting the fruit thoroughly ripen, avoid picking early, and the result is a dark sample. It is his intention to go to Renmark in a few weeks' time and observe the process there; he was anxious to see the machine for stemming and grading at work. There was no doubt that in order for this district to compete in the market it was necessary for them to unite and have a common

factory for the treating of the fruit to gain uniformity. Mr. Harrison Richardson, who is now at Nuriootpa, has had some years of experience in currant-growing at Renmark, attended the meeting by invitation. He was pleased to attend the meeting and give the members the benefit of anything that he knew. He said there was of course a difference in the climate at Renmark, and due allowance would have to be made. His experience was that wire-netting trays filled with fruit and dried in the stack gave the best result. At Renmark the grower dries and sends the fruit to the Co-operative Factory in sweat boxes for stemming, cleaning, grading, and packing. This system gave a uniform sample, and he advocated the adoption of it here. It would be necessary to keep pace with other places to gain quality and thus price. Organisation was the only means whereby success in marketing can be gained.

Balaklava, February 12.

(Average annual rainfall, 15 $\frac{1}{2}$ in.).

PRESENT.—Messrs. Neville (chair), Tuck, Anderson, Spillane, Baker, Traeger, Curtis, Wurfiel, Goldney, Thomas, Upill (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—The Chairman read the following paper :—“ In 1908 the Government decided to offer prizes for new wheats which gave best results in different parts of the State, the milling qualities to be taken into consideration, and wheat to be grown under Government supervision. Five wheats were entered for competition in the Mid-North division, namely, Federation, West Australian Crossbred 73, Richter’s Eminence, Flinders, and Hardy’s Elation. At the request of the Secretary of the Advisory Board of Agriculture I undertook to grow the wheats in this district for the competitors. The seed was drilled on the 5th and 6th of May, in five 2-acre plots, with 1bush. of seed and 1cwt. of super. per acre. The ground selected was red loam with clay subsoil. Owing to the very wet winter, the results would have been better on lighter land or land with a made subsoil. Selected Federation made rapid growth from the start. It was a very thick crop, rather badly cut with the hot winds, a grand wheat for tillering. This wheat, although inclined to shell easily, has proved itself a good yielder in this district. In this case the yield was 30bush. 18lbs. to the acre. Crossbred 73, a Western Australian wheat, grew very quickly in the winter. It had a fine straw, lean close to the head. It went down badly; in fact, a lot of it was broken off before the crop ripened. It was slightly affected with black rust. [Flag smut.—ED.] I would not recommend it as a wheat for our district. The yield was 15bush. 19lbs. Richter’s Eminence is a mid-early wheat of the red straw variety, and germinated well. It has a very coarse, hollow straw, rather thin head, and was badly touched with black rust. A very tall grower, patches of it being 6ft. high. The yield was very disappointing, being 16bush. per acre. Flinders is a late wheat. An extraordinarily good tiller. White straw, medium height, with beautiful head, inclined to shake. Slightly affected with leaf smut, and a good lot of ball smut. This was an ideal plot to look at, but was badly drained, water lying on portions of it for several weeks. The yield was 22 $\frac{1}{2}$ bush. I intend to give this wheat another trial. Hardy’s Elation—Mid-early wheat, germinated and tillered well. It was a dark strong hollow straw, of medium height, very dark club head, grain easily shaken out, slightly touched with black rust. Portions of the ground planted on were very wet. Result, 18bush. 4lbs. per acre. I would like to draw your attention to the fact that these wheats, with the exception of Selected Federation, are all new to our district, and if grown for another year or two might prove to be good yielders. I am pleased that the Agricultural Department has established a farm at Parafield to experiment with the cross-breeding of wheats, as I am convinced that this branch of the department is going to do a lot for our wheatgrowers in the future.” Mr. Tuck was grateful for the valuable information he had received. The results showed what could be done with different kinds of wheat sown on the same kinds of land with the same working and the same kind of manure. They also showed what an important matter it was to get the right sorts of wheat for the class of land to be cultivated. He was sorry that some of the plots were disappointing in their returns, but the season was against the experiments, being too wet where there was a clay bottom. He thought Federation was a good wheat, but not a dependable one. This year with him it did particularly well, going 28bush., the same as Yandilla King. The harvest out his way was very good indeed, but they had a little trouble with takeall, and in some paddocks there was a good deal. Mr. Anderson said Federation wheat had taken the lead in South Australia this season, but in New South Wales it had been a failure. Perhaps some of the wheats which did not yield well this season might do better in others. He had found that a few days’ difference in sowing sometimes made a great deal of difference in the result. For instance, he had sown some

of the same kind of wheat on Wednesday and on Saturday of the same week. That sown on Saturday yielded nearly double that sown on Wednesday. He had one paddock badly affected by takeall. Mr. Traeger referred to the success he had had with Leather Head wheat, the seeds of which he had obtained from Mr. Andel. It was sown in the first week in March, and it was showery weather at the time. It grew well but rather spindly, but it headed out well afterwards. Some who saw the crop said he would not get much from it, as it was subject to rust; but he took particular notice of it and did not see a speck. The Chairman pointed out that it was the healthiest crop he had seen growing. He would like members to try the wheat. It grew alongside Marshall's and yielded 43 $\frac{1}{4}$ bush., whilst Marshall's gave 30bush., Federation 33bush., and Yandilla King 30bush. (The Chairman pointed out that practically no wheat was affected with red rust this season.) Mr. Wurfel said Marshall's did best with him, going about 3bush. more than Yandilla King. Yandilla King should be sown early. With a season like the past one he would rather have Federation, but the year before Yandilla King was the best by about 7bush. Mr. Goldney said at first it was thought crops on his farm were thin, but they turned out well, and the yield was almost uniform. In one paddock they had four varieties growing—Federation, King's Early, Newman's, and Lot's—and the paddock averaged 25bush. per acre. They grew Leather Jacket for several years, but whether it was Leather Head, as grown by Mr. Traeger, he could not say. It was subject to rust in wet seasons. It was a mid-season wheat. Mr. Spillane's experience with Federation wheat was that it was splendid on heavy land, but it did not seem to do so well on light land. It seemed to be affected by the time it was sown, a week difference in time affecting the result. Some takeall was seen in the patch which was caught by the hot winds, having been sown in May. Marshall's grew well, but was not equal to some other seasons. In some places a lot of heads broke away. He once grew Leather Jacket wheat, which he got from Mr. Heard. That wheat seemed to have been what was now called Leather Head. It bleached badly, and rusted a good deal. It was a beautiful crop, promising 40bush., but it rusted so badly that it was cut for hay. He asked if any members had grown Jonathan, which yielded 23bush. with him, and did not look a very big crop. Mr. Curtis had grown Federation, which also had yielded best on clay land, but with him on marly land it was affected with takeall. Yandilla King beat Federation by 3bush. Marshall's gave a good crop of hay, but it was blighted. He had three acres of Bluey, which went 27bush. It was a splendid grain and hay crop, but it shook out a little. Steinwedel was badly affected with takeall. Mr. Uppill had a difference of 7bush. for Yandilla King over Federation, but the former was sown under rather better conditions. Silver King beat Federation by 3bush. His land seemed more suitable for Silver King and Marshall's. He thought Federation inclined to takeall. They had only little takeall on some of last year's fallow. They had excellent results with the Yandilla King. It was rust-proof, and could be cut for hay if necessary. The Chairman had heard farmers say that only Federation should be sown, but it had been proved this season that it shook out badly. His best result was with Yandilla King, which yielded 30bush. On the windy Monday which they all remembered, it stood whilst other varieties went down. It had a thick chaff, and was not bleached, because the heads turned down and the water ran off instead of being held in the ear. He thought Federation came out on top this year in the Balaklava district.

Nantawarra, February 23.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Smith (chair), E. and A. Herbert, R. and J. Nicholls, Greenshields, Sutton, Dall, Sinclair, Sleep, Dixon, Gosden (Hon. Sec.), and two visitors.

SALT RESERVE.—The Crown Lands Department advised that the request of the Branch that portion of the Salt Lake near Lochiel should be resumed for use of the residents had been agreed to, and the reserve had been placed under the control of the Snowtown District Council. Landowners will now be able to obtain crude salt from the lake for their stock.

SHORT WEIGHT BINDER TWINE.—Mr. Dall reported that last season he weighed two bales of binder twine which he had just received, and found them about 8lbs. short in weight. He apprised the firm from which the twine was purchased, but the reply he got was that they thought all farmers knew that firms selling twine were not responsible for underweight packages. Members considered this very unfair, and contended that if they paid for 1cwt. of twine the sellers should be compelled to deliver full weight.

PRICE OF WHEAT AT PORT WAKEFIELD.—Mr. R. Nicholls called attention to editor's statement on page 450 of December issue, that there had been no alteration in the margin between Port Adelaide and Port Wakefield wheat prices. Members were certain that the margin of difference had been increased from 2d. to 2½d. per bushel, and this loss of ¼d. per bushel represented a serious loss in the aggregate to the district.

Nantawarra, March 23.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Dixon (chair), A. and E. Herbert, J. and R. Nicholls, Sutton, Sleep, Gosden (Hon. Sec.), and two visitors.

HARVESTER AND WASTE WHEAT.—Mr. E. J. Herbert said a good many people were remarking that the harvester wasted more wheat than the stripper, because since the rain the paddocks reaped with the harvester were showing much more growth of green stuff than those reaped with the stripper. In his opinion, however, there was no evidence to support the view that, properly managed, the harvester wasted more wheat than the stripper. Those who held this view appeared to forget that with the latter machine all the grain gathered, whether plump, or small and shrivelled, was removed from the field, whereas the harvester left these blighted grains in the paddock, and as they would germinate and grow the difference in the appearance of the fields was easily accounted for. Members thought that this explanation was a very reasonable one.

BURNING STUBBLE.—Mr. R. Nicholls said that experience in New South Wales had shown that stubble-burning had a beneficial effect on the soil, and his experience had been similar. Mr. Herbert thought that any benefit received was due to the action of the fire on the soil, rather than to the ashes from the stubble. He had tested this by scattering ashes from the fireplace on a small patch, while alongside he scattered some rubbish and burnt it, the result being much in favor of the latter. Mr. Sleep admitted that burning did good, but it sometimes caused the crop following to blight off. On the whole he preferred to feed off close.

Salisbury, March 1.

PRESENT.—Messrs. Moss (chair), J., A. J., and A. H. Harvey, Tate, Hartmann, Whittlesea, Ridley, Webb, and Jenkins, (Hon. Sec.).

IMPROVEMENT OF ORANGES.—The Chairman spoke on the question of improvement of oranges. Owing to the splendid soil found in the flats locally, he said, growers were to an extent lax in their efforts to produce first-class fruit with a uniform thin skin. The fruit grown here was noted for its flavor and color, and if only oranges with thin skins could be produced as well as these other good qualities, an almost perfect sample would be produced. He recommended planting strong-growing varieties on the poorer class of soil, and the others on the good soil, so that something like uniformity of fruit would result. Of the more common varieties of orange the Sabina had proved with him to be best for production, marketing, and its tenacity in hanging. Although at one time doubtful of the Washington Navel as a bearer, experience had proved it to be a good cropper. The only drawback was that these oranges came in early and did not hang to the tree well. One of the best of the well-known varieties of Mandarin was the Canton. It was, perhaps, the most prolific bearer, and produced compact fruit with the true Mandarin flavor. A good general discussion followed.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Arthurton, February 24.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Welch (chair), Lamshed, Bull, Rowe, Wicks, Crosby, Westbrook, and Stephenson (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. T. B. Wicks. After formal business had been transacted, over two hours were spent in looking round

the farm. The vines in the garden received considerable attention, and it was observed that the sparrows were playing havoc with the fruit. To protect them from the birds many of the bunches of grapes were covered with paper bags.

BEST WHEATS.—Discussing harvest results, it was generally agreed that the Yandilla King and Federation had proved the most profitable wheats for this district.

Arthurton, March 21.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Short (chair), Westbrook, Bull, Klein, S. T. and A. G. Lamshed, Williams, Page, Stephenson (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. W. R. Stephenson, and a considerable part of the afternoon was spent in looking round the farm. The young draught stock received considerable attention, and a three-year old stallion was greatly admired.

DRY BIBLE.—Considerable discussion on this subject took place, the Chairman reading the preliminary report by Veterinary-Surgeon Desmond. Mr. Lamshed said whatever the cause of the trouble in other parts he had no doubt whatever that on his farm it was poison weed that was to blame. Mr. Bull had known of horses being killed by poison weed when chaffed with hay, but so far he had not known cattle to be injured by it. Mr. Short said he had known of sheep dying from the effects of poison weed in this district, and he agreed with Mr. Lamshed in attributing losses of cattle from so-called "dry bible" to this weed. The Hon. Secretary said that from a lengthy experience with cattle, both in England and in this State, he was satisfied the trouble was brought on by too much dry feed, and when the trouble reached an acute stage it was incurable. He was positive the disease could be prevented by proper feeding. In the summer the cows should receive bran and molasses regularly. He had followed this practice for a long while, and though he had kept a good many cattle during the past 10 years he had not lost one, while all around him they had died by dozens. [It is not certain what this poison weed mentioned in report is. Probably, however, it is a species of *Pimelia*, which is indigenous to the district.—Ed.]

Kadina, February 24.

(Average annual rainfall, 15½in.)

PRESENT.—Messrs. Malcolm (chair), Roach, Pedler, and Southwood (Hon. Sec.).

ROTATION OF CROPS.—Mr. Malcolm read a paper on this subject. One of the most important matters connected with successful agriculture was a proper understanding of the requirements of the soil of the farm, and an analysis of the soil was very necessary. Farmers might be able to conduct a sufficient analysis for most purposes, but if not they could obtain it at a cheap rate from the School of Mines. By means of such analyses they would know what was required to grow the best crops. [Unfortunately for the farmer ideas put forth of analyses as a guide to cropping and manuring have not been borne out by practice. The best authorities now recognise the fact that there are so many other important factors governing the fertility of the soil that a knowledge of the actual quantity of plant food in the soil cannot be accepted as a guide to the treatment of the soil. The idea of farmers being able to conduct soil analyses in a general way is quite impracticable.—Ed.] The condition of the soil can be changed for the better by growing different kinds of plants. Different plants require different substances for their development, and the benefit of a change of crop has been long understood in Europe. Naturally the class of crop grown must depend partly upon the soil and climate, and partly on market demands. Experience has also shown that a change in the variety of wheat grown is beneficial.

Moonta, February 9.

(Average annual rainfall, 15in.).

PRESENT.—Messrs. Bray (chair), F. H., and E. Nankivell, Bauer, Cooper, Evans, Laidlaw (Hon. Sec.), and four visitors.

EXPERIMENTS WITH MANURES FOR WHEAT.—Mr. Atkinson reported on experiments he had conducted with different quantities of manure for wheat. He put in 25 acres

with a bushel of seed and a hundredweight of manure to the acre, and reaped a return of 20bush. per acre. A similar plot with the same quantity of seed and only 75lbs. of manure yielded 27bush. to the acre. Members were agreed that for Mr. Atkinson's class of land 75lbs. of super. per acre was sufficient, but the local sandy soils needed a hundred-weight of manure per acre.

WESTERN DISTRICT.

Butler. March 22.

(Average annual rainfall, 13in.)

PRESENT.—Messrs. Tremberth (chair), Harrowfield, Barr, Parker, Morgan, Morrison, Phillis, Easter, Young, Jericho (Hon. Sec.), and six visitors.

LUCERNE.—Mr. Parker tabled fine growth of lucerne from his stubble paddock. Since the rain in the early part of the month it had made over 6in. of growth.

PICKLING WHEAT.—Some discussion on this subject took place. Most of the members advocated pickling with bluestone, but several stated that they had no more smut from unpickled seed than from seed pickled with bluestone. Arrangements were made to sow two or three acres each with seed pickled with bluestone and fungusine respectively on land that this past season carried a crop that was nearly all smut.

Koppio, February 24.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Newell (chair), Thompson, A., G., and M. Howard, Brennand, Price, G., F., and M. Gardiner, Barraud, F. and R. Richardson (Hon. Sec.), and one visitor.

SILOS.—Mr. Barraud introduced the question of silo-construction and ensilage-making by reading an extract. He thought the twhere sand could be obtained concrete walls with a cement facing would be best. They should be 18in. to 2ft. thick, two-thirds being under ground and the one-third above. To make sour silage he would cut the crop when full grown and cart it as speedily as possible. If maize or sorghum it would be best chaffed, while grass would make good ensilage in its long state. Sweet ensilage could be made by leaving the crop in the paddock a day or two after cutting it, and then filling up the silo with it slowly. A lengthy discussion followed, members being of opinion that ensilage was a splendid fodder, and should be made locally, provided sufficiently good crops could be grown. They considered that the overground silos were the best.

POTATOES AND TOMATOES.—Mr. Barraud tabled splendid samples of potatoes and tomatoes, grown on his property.

Merghiny, March 3.

PRESENT.—Messrs. Talbot (chair), Bubner, Shilton, and Symonds (Hon. Sec.).

SEEDING.—Some discussion took place on this subject. Mr. Bubner preferred to plough in February and start seeding in March, but Mr. Talbot would wait till April, as they were more likely to get enough rain then to ensure a good germination. He would have both plough and drill going at the same time, and could put in 100 acres a week with a 15-disc drill, using two teams. Discussing smut, Mr. Bubner mentioned that he sowed Newman's and Gluyas wheats without pickling, and while the former had some smut in it, the latter was clean, except for some on the flag. [The latter disease is quite distinct from ball smut. Gluyas appears very susceptible to flag smut.—Ed.] He preferred formalin, used at the rate of 1lb. to 40galls. of water for 10 bags of seed. When dipping he preferred the bags to be full. Mr. Talbot would pickle about half a bag at a time when dipping, as it was more convenient to handle, and the grains were more likely to be thoroughly pickled.

Mitalie, February 26.

(Average annual rainfall, 14½ in.)

PRESENT.—Messrs. Jacobs (chair), J. A. and M. J. Laffin, Story, Williams, Hier (Hon. Sec.), and four visitors.

BUSY FARMERS.—The Hon. Secretary said that, having been in recess for the two busiest months, members should now make every effort to attend the meetings, so that they might be made as interesting and useful as in the past.

TREATMENT OF WOUNDS IN LIVESTOCK.—An interesting paper on this subject was read by Mr. Story as follows:—“ Accidents are constantly occurring among livestock, and the impossibility of getting veterinary assistance forces a farmer to be his own surgeon. There are four kinds of wounds, viz., clean cut, torn, bruised, and punctured. A clean cut wound running lengthwise with the muscle is the easiest to manage. First see how deep it is, make sure there is no foreign substance in it, and then stop the bleeding by applying hot or cold water. If a large artery has been cut, tie it. Put a teaspoonful of carbolic acid into a quart of water and let a little run over the cut surface. If the wound is not deep the edges of it can be drawn together by silk thread stepped in the above solution. If the wound is across the muscle or an inch or more in depth do not put in stitches, because the cut ends will move below them. Torn wounds should have the bleeding stopped as described, and then be cleaned by letting water run over them. Do not try to sew them up. If the wound assumes an unhealthy appearance, use acetate of lead, ½ oz.; sulphate of zinc, ½ oz.; carbolic acid, 1 dram; and water, 1 quart. Clean the wound with water and apply this lotion twice a day. Punctured wounds are the worst of all, because they are liable to have foreign substances, such as hair and pieces of wood within, causing inflammation and sometimes mortification and death. To treat these probe the part to find the depth and direction of the wound, see if there is any foreign substance in it and remove it. Clean it as well as possible, then dip a piece of soft muslin in a solution of carbolic acid, 3 drams to 4 ozs. water, and press this to the bottom of the wound. Let it remain a few hours and then draw it out and put in a fresh one. Do this three times a day. When the wound begins to produce matter the danger is passed. Clean it out twice a day and inject a little of the carbolic acid lotion used for cut wounds. Bruised wounds if bathed with acetate of lead, ½ oz. to 1 quart water several times a day will not become inflamed. Sometimes matter will collect and the parts will swell up and become soft and puffy. In such a case open it and inject a little of the following twice a day:—Zinc chloride, 2 drams, water 1 quart. If it leaves a thickening, rub with the following ointment every second week. Biniodide of mercury, 2 drams; lard, 3 ozs.” The paper was fully discussed, and members thought no farmer could afford to neglect wounds in stock.

Mitchell, February 26.

PRESENT.—Messrs. D. Green (chair), J., O., and P. Green, Ness, Moloy, and Vigar (Hon. Sec.).

DIFFICULTIES OF PIONEER WORK.—The Hon. Secretary read a paper, and discussion ensued upon some of the difficulties to be overcome in this district. The Hon. Secretary was requested to take certain action regarding the mail service and other matters, such as roads and education, which were thoroughly thrashed out.

Shannon, February 26.

PRESENT.—Messrs. Proctor (chair), Fleming, Habner, Kain, Carey, Havelberg, V. and G. Gordon, W. M. Smith, sen. and jun., L. B. and E. B. Smith, J. and M. Cronin, Williams, J. J. Cronin (Hon. Sec.), and one visitor.

WATER SUPPLY.—Mr. M. P. Cronin read the following paper on this subject:—“ Water conservation is a very important matter in this district. I think boring should be tried in places that have been located by means of the divining rod. Failing a supply of good stock water from this source, a dam should be excavated capable of holding enough water to supply all the wants of the farm until the next winter rains. The bigger the dam the better, as it is better to have a few thousand gallons over at the finish of the summer than the reverse. It is a good plan to have a silt pit in the drain leading into the dam to catch any silt instead of washing it into the dam. Windmill and storage tanks can be erected to supply water in a trough, and horses can then be kept out of the dam. A windmill suitable for this work need not be very powerful, and should not cost

more than £10. Another very good mode of supplying water for stock is to make a good underground tank, provided with suitable catchment, such as the iron roof of a stable." Mr. Fleming thought that in this locality a dam would meet all requirements. A farmer could make a dam in every paddock if needed, as there were any number of water runs and plenty of good holding ground. Boring had been tried, but salt water had been struck in nearly every instance. A dam should be netted in to keep the vermin, &c., out, and a windmill or pumps should be fixed up. Mr. Smith was also in favor of making large dams and fixing a windmill to draw the water. If stock were allowed to go into dams there were always some of them that would roll in the water, especially in summer time. Mr. Carey thought it a good plan to make underground tanks where the ground was suitable. They kept the water cool in summer time, which was a consideration. Considerable further discussion followed.

EXHIBITS.—Mr. Smith tabled samples of fruit and vegetables grown on his farm near the railway station. There were watermelons, grown on loamy ground with dressing of stable manure. These showed splendid growth; the quality was first class, and they were much appreciated by members present. Apples.—The first grown in Shannon, Jonathan variety, fairly large sample, of splendid flavor. Muscatel Grapes.—Grown in loamy soil, from rooted vines, were also shown.

Shannon, March 26.

PRESENT.—Messrs. W. Proctor (chair), W. and H. Glover, Irons, H. Proctor, Habner, Smith, sen. and jun., P. and M. Cronin (acting Hon. Sec.), and five visitors.

BREEDING FARM HORSES.—Mr. Cronin read a paper on this subject. In view of the high prices realised for farm horses, the breeding of horses on the farm was well worthy of their attention. In this district every farmer should try to rear two foals each year, and when the feed gets better after the land has been cropped, it will pay to raise more foals. As the sire played such an important part in breeding, great care should be exercised to secure sound animals of good pedigree. When characteristics have been transmitted from generation to generation they become fixed, and the good points of pure-bred stallions are more likely to be transmitted to his progeny than those of a half-bred. For their district the mares selected for breeding from should not be too heavy. He would spell them for at least a month before foaling, or at any rate, give only the lightest work. Mares that are inclined to rush things cannot be worked so close up to foaling as one that is slow and steady. Care should be taken that the mares are not too fat at foaling time, but at the same time they must not be allowed to get poor. The paper led to a good discussion. For this district Mr. Habner favored mating a good Clydesdale stallion with a light mare. Members generally favored weaning the foal at about six months. Mr. Smith would tie them up occasionally when young, as they were quieter when handled for breaking in. Mr. Proctor agreed that mares should be spelled for about a month before foaling, but Mr. Glover considered it safe to work them to within a few days of foaling if they were in good condition.

HINTS FOR THE ORCHARD.—Mr. P. Irons read a paper on this subject to the following effect:—"Fruit-growing for profit is a trade or business, and to get the highest measure of success the orchard must be made to produce the fruit of the best quality at the least cost. In my opinion the farmer should not go in for an orchard unless he can afford to put a capable man on to look after it, as otherwise the orchard is sure to be neglected at the time when it most needs attention. I think, however, that all farmers should have a few trees and vines around the homestead. The fruit can be dried and put away for winter use, or a few cases preserved and put away comes in very handy when all the fresh fruit is done. There are two ways the farmer can start his vineyard, viz., by getting cuttings from Adelaide or from a neighbor's garden, or by getting rooted vines. In all cases I would advise getting one-year-old rooted vines, as they have one year's growth on them, which means a lot in this country, as watering them is the most trouble. Cuttings should be cut about 9in. or 1ft. in length, and planted about 6in. apart in a well-prepared bed for the purpose of striking, care being taken to press the dirt tight around the bottom. The chief causes of cuttings not striking are not pressing the dirt around the bottom, insufficient water, and planting the cutting with too much wood showing above the ground. There should not be more than 2in. or 3in. of the cutting showing, as the cutting depends on getting moisture from the ground, and if there is too much wood above it will not keep alive till the roots make their appearance. The piece of ground intended for the garden should be well grubbed for the depth of a foot down, and then fallowed about

10in. or a foot deep. This can be done by means of two single-furrow ploughs, one to go along about 6in. deep, and the other without the mouldboard to do the subsoiling. After the ground is fallowed it should be deeply cultivated several times during the summer to sweeten the soil. After the first rain in the autumn the ground should be ploughed again as deeply as possible and the holes dug ready for planting. Vines should be planted 10ft. apart, and care taken to plant them in line, as if they are out of line it greatly hinders ploughing and cultivating. The orchard or vineyard should be ploughed twice a year—the first time as soon as the ground is fit and the weeds have got a start: leave the ground in its rough state, as it will give the rain a better chance of penetrating the soil. The second ploughing should be commenced in August. When the ploughing is finished start cross cultivating to cut out the ridges left by the plough, and level the ground. After this operation there will be very little left to dig. If the digging is left fairly late, one digging will kill all the weeds. Pruning can be commenced as soon as all the leaves fall off, and should be finished before the first week in August."

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Lameroo, February 26.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Eime (chair), Skinner, Edwards, Bowen, Jeffrey, Gibbon, Messenger, Leckie, Dunstone, White, Mead, Sinclair, Wray, W. J. and E. J. Trowbridge, Perkins, McMahon, Ross, Koch (Hon. Sec.) and six visitors.

HORSE-BREEDING.—The following paper was read by Mr. W. J. Trowbridge:—“The subject of horse-breeding is one in which we should take great interest. If it were not not for the horse we would find farming a very difficult matter indeed. I advocate breeding the very best stock possible, not only for work, but for selling purposes also. The best horse to breed on the farm is the draught. Get good stretchy mares with plenty, of timber, and stint them to a good, sound, compact, draught stallion, and you will get stock that will stand any kind of heavy work and also realise big prices. No doubt lighter horses will stand a good deal of work, but they cannot stand heavy work and look well for very long, and you can never put the confidence in them that you can in the draught stock. The Clydesdale is a good strain to have in your animals, although there is a tendency to a deficiency across the loins, which mostly becomes more noticeable when the stock attains the age of twelve years or more. There is the Suffolk Punch, also, which is a splendid strain, and if crossed with good draught would be very pretty and useful stock indeed, and, in my opinion, very hardy also. Care should be taken to select a sound, hardy, sire; for if the sire has blemishes, in nine cases out of ten the progeny will be affected. It is of no use getting the best of mares and sires if the foals become stunted when young through lack of proper attention. It is well known to all stockbreeders that a foal which is not well cared for is very much behind what he should be at four years old. It does not pay to rear foals unless they are properly fed.” Mr. A. J. A. Koch said they would find it easier to breed light horses than draught. This was a bad district in which to travel a big horse, and therefore they did not always get the best stallion here. It was no use breeding from a horse they could not work, and the best mares should always be utilised. He considered the Clydesdale a better horse than the Suffolk Punch. If they wanted a team of good big horses, his advice to them was to breed them themselves. The Chairman said it was very necessary to have this matter thoroughly discussed, as there was much room for improvement in the breed of horses suitable for this part of the State. Several other members and visitors joined in the discussion, and the consensus of opinion seemed to be that Suffolk Punch-Clydesdale cross would produce a very serviceable farm horse. Mr. Leckie did not think the Suffolk Punch-Clydesdale cross would be a success, for the reason that the former were quick-tempered animals, while the latter were slow.

Parrakie, March 19.

PRESENT.—Messrs. Dayman (chair), O. and C. Heinzel, Sowerby, F. and W. Threadgold, Schmidt, Beelitz, Secor, Ferme, Gravestocks, Wittwer, Gilfillan, Bottroff, Short, and Burton (Hon. Sec.), and three visitors.

DRAKE.—Mr. Schmidt tabled samples of drake in the straw, and also watergrass, both plants being very similar in appearance. Members wished to know the origin of drake, and how it came into new land. [Members should read their *Journals* more carefully. In the February issue, page 627, in report of Kalangadoo Branch, this question was dealt with.—Ed.]

SMUT IN WHEAT.—Mr. Schmidt wished to know best method of pickling wheat to prevent smut, and tabled some heads of wheat which contained sound grain on one side and smut balls on the other. Most of the members favored pickling with bluestone. [The question of partial "smutting" of wheat ears is dealt with in the "Inquiry Column."—Ed.]

RAINFALL.—Record for 1910, to March 21st, nearly 5½ in.

Rhine Villa, February 18.

(Average annual rainfall, 10½ in.)

PRESENT.—Messrs. Payne (chair), Hecker, Cowland, Vigar (Hon. Sec.), and three visitors.

QUESTION DAY.—This meeting took the form of a question day, and the following opinions were expressed as answers:—

WHEATS FOR DISTRICT.—Federation is the best wheat in this district for grain, and Dart's Imperial for an all-round grain and hay wheat.

SUPERPHOSPHATE AND HAY.—Members were of opinion that hay grown with super. was not injurious to stock. They thought, however, that it was not so nutritious, and that consequently more oats, &c., was needed by the stock in addition to the hay.

LUCERNE.—It was considered that lucerne could be grown to advantage on the Rhine Flats if irrigated during the first summer. After that it could take care of itself.

Sutherlands, February 26.

(Average annual rainfall, 9 in.)

PRESENT.—Messrs. Thiele (chair), Mibus, Dohnt, Noack, Doecke, G. and J. H. Geyer, Twartz (Hon. Sec.), and one visitor.

GRASS CATERPILLARS.—Messrs. G. and J. Geyer showed specimens of grubs which were eating dry barley grass on their property at night. They were found mostly in dry mallee country. Discussion as to how to destroy them took place, and various suggestions, such as electric wires and tanglefoot, were made. It was decided to send them to the department for advice as to the best means of destruction. [Probably the best way to destroy these grubs will be to distribute baits of bran to which Paris green has been added in the proportion of 1lb. of Paris green to 15lbs. bran, the mixture to be damped with a little water to which sufficient salt has been added to make it brackish.* If large areas are affected, sow from 1bush. to 2bush. per acre of the mixture, according to the thickness of the crop. Of course stock and poultry must not have access to the baits.—Ed.]

Sutherlands, March 19.

(Average annual rainfall, 9 in.)

PRESENT.—Messrs. Snell (chair), Mibus, Byrnes, Noack, Geyer, Dohnt, Broadbent, Twartz (Hon. Sec.), and two visitors.

SOWING WHEAT AFTER EARLY RAINS.—In discussing this question the Chairman said it was unsafe to sow after the very early rains, as if warm weather followed the plants would not stool out properly without feeding off.

CATERPILLARS.—Members wished to know whether other Branches had had trouble with caterpillars eating off barley grass, and what means were employed to destroy the pest. They were of opinion that cultivating the land would have the desired effect.

FOXES.—Members were of opinion that the best way to protect poultry from foxes was to enclose the poultry in yards made with 6ft. high wire netting.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, February 22.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Stone (chair), Jacobs, Ricks, Strange, Lewis, and Curnow (Hon. Sec.).

WATTLE BARK.—Mr. Ricks initiated a discussion on the question of the low price of wattle bark. He considered the present price as low as it was profitable to grow wattles. He thought that if the price fell lower the growers would be justified in asking for protection from the cheap South African bark by the imposition of an import duty on the imported article. Mr. Jacobs thought £6 a payable price. He did not think that wattle country could be made to produce a more profitable crop at that figure. He considered £3 clear profit per ton payable.

FAILURE OF MELONS.—Mr. Jacobs asked if members had noticed the peculiar manner in which various kinds of melons—such as sweet, water, and pie melons—had died back after the fruit had developed to quite a large size. He had noticed the trouble years ago, but only to a slight degree. This year, however, it was exceedingly bad, and he thought he would lose them all. He had used new seed, and the plants had been well cared for. The land had been well manured with pig manure, fowl manure, bonedust, and salt, and the plants had been watered twice a week. A part of the ground had not been watered, and this had been manured only with bonedust. In each case, however, the dieback had occurred. He had examined the roots, but could see no trace of grubs or injury to the roots. Sometimes only one or two runners on a vine would die back. The melons had not been planted twice on the same ground. [It is impossible to form any definite opinion as to the cause of this trouble. Too much water, extremes of temperature, *i.e.*, hot days and cold nights, or disease may be contributing causes.—ED.]

Hartley, February 17.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Wundersitz (chair), Brook, Clark, Tydeman, Pacch, Pratt, Stanton, and Birmingham (Hon. Sec.).

BAD TOOLS.—A general discussion took place on the losses incurred through using blunt and clumsy tools. In addition to such tools and implements as axes, crowbars, and other hand appliances, it was pointed out that unless the knives of the binder or grass mower were kept sharp there was undue strain on the machinery, wear and tear was considerably increased, and breakages occurred more frequently, while it was much harder work for the horses.

ENSILAGE.—Mr. Wundersitz said that he had been very successful in making ensilage in a disused limekiln. He was now cutting out the stuff, and it was in first-class order, there being practically no waste at all.

Longwood, February 19.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. W. Nicholls (chair), J. Nicholls, Hughes, Vogel, Pritchard, Doley, Roebuck, Quinn, Glyde, Furniss, Coles (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of the Hon. Secretary. The orchard was inspected, and Mr. Coles explained that manuring was carried on as follows:—With the early cultivation a small quantity of stable manure was applied, and this was followed at intervals with bonedust, sulphate of potash, and nitrate of soda up to 1lb. of each per tree. The trees have made good growth and are not losing their fruit. The fruit is coloring well. Members considered that summer pruning had been carried out too severely and that the trees were left too open.

DISPOSAL OF FRUIT.—After tea had been partaken of the question of disposal of fruit, particularly in glut seasons, was discussed. A suggestion from the Forest Range Branch was agreed to, and delegates were appointed to go into the matter and confer with other Branches.

APPLES.—Mr. Nicholls tabled a Golden Spire apple. This, and a Hoary Morn exhibited by Mr. Roebuck, were claimed to be good keepers and prolific bearers.

POTATOES.—Mr. Roebuck reported that potatoes planted by him at Christmas time had, up to the present, a healthy appearance. The seed was steeped in Burgundy mixture for five minutes and then dried in the sun before planting.

CLUBFOOT IN CABBAGE.—All the cabbages growing on a plot in Mr. Roebuck's garden, which was previously planted with beans, were affected with this disease, so that in his experience rotation of crops had no preventive effect. He advised resting the land from cabbages for two years. Dr. Chase recommended the application of lime and salt.

BORING FOR WATER.—Mr. Coles exhibited a template of an appliance which he had made for boring for water. In soft sinking it had been successful to a depth of 30ft. He said he would be glad to furnish particulars to any inquirers.

Lyndoch, March 26.

(Average annual rainfall, 23in.)

PRESENT.—Messrs. Warren (chair), Kennedy, Lawrence, Woodcock, Hammatt, Klauber Springbett (Hon. Sec.), and one visitor.

USEFUL HINTS.—The Chairman read a short paper on this subject, dealing chiefly with contrivances which he had found useful on the farm. The blacksmith shop was one of the most useful things to have on the farm, as with a few tools and a little practice the average farmer can do many things that save time and bother. He found that a worn-out three-cornered file if heated to blood heat and then cooled will cut iron or steel. An old rasp or piece of drill steel can be turned into a good cold-chisel. When tempering he found it best to heat a good portion of the steel, as the implement was not so likely to break as if the point only is tempered. Sharpen the tool first with the hammer, then file clean and heat to blood-red, cool the point in water, and file again. In tempering tools attention must be given to color. Some steels require different treatment to others, and this can only be ascertained by actual experiment. It is often difficult to sharpen a tool just when wanted because there is no one available to turn the grindstone. If a treadle is used on one side the stone will never wear even, but this difficulty can be easily overcome. Take a piece of iron [What thickness?—Ed.] a little longer than the short arm on the spindle, and punch two holes in it. Into one hole tap and screw a short $\frac{1}{2}$ in. square-head bolt, and fit the other hole on to the spindle, cutting the latter the right length. Bore a hole through the iron and spindle and insert a stout wire nail. Now fit two treadles to the spindle, fix an old bicycle seat in front of the stone, and an oil drum with tap for water above, and you have the means of sharpening tools in a convenient manner. Most people have had trouble with the packing in their pumps. He found the Silverton paragon steam packing most satisfactory, as if properly put in it lasted two or three years. For either windmill or spray pump this was useful. First carefully measure the space between the rod and the box, cut a strip of packing to fit so that it makes a neat joint, and insert this. Then put in another strip of packing, taking care that the joints in the two strips do not come one above the other. As a torch for lighting stubble, rubbish, &c., and for starting fires to burn back against a bush fire, the following will be found invaluable:—Get a piece of old brass curtain-pole or small piping, bend it, or screw on a bend [Where?—Ed.], put in a little budding cotton, then flatten the end a little to hold the wick, cork up the end tightly, fill with kerosine. At a stable a door or gate is often a nuisance, while slip-rails get knocked all over the place, or when they fall nine times out of 10 they cannot be handled without the hands getting dirty. To overcome this, get some 2in. piping, cut it into suitable lengths and fix them securely to your posts. Then get 1 $\frac{1}{2}$ in. pipes which will just slide inside the 2in. pieces, put collars on the ends to stop them sliding in too far, and make a hole in the post at the other end for the collars to fit. This makes a neat, serviceable sliprail—which is always in its proper place. Other items were also described.

Port Elliot, February 19.

(Average annual rainfall, 20 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Welch (chair), Vince, Pannel, Green, McLeod, Chibnall, and Hargreaves (Acting Hon. Sec.).

ENSILAGE.—Mr. Gurr's paper on this subject was read and discussed. The paper ran as follows:—“It is strange that in South Australia, where there is usually an abundance of herbage at one time of the year and a shortage at others, that more farmers do not make some provision for the needs of stock during those periods by making ensilage.

Nature is kind in this land, and stock can usually manage to survive on the natural pasture with the addition of a little hay, and perhaps this accounts for the lack of enterprise in this direction. Ensilage has been proved to be more profitable than hay—especially to the dairymen. Where a farmer produces 1½ tons to 2 tons of hay per acre he can cut 3 tons of green fodder, and this will produce over 5 tons of ensilage. [?—EDITOR.] The sheepfarmer would also find ensilage profitable, but care must be taken in the feeding of silage to horses. American experience has shown that it may be fed to horses in regular quantities, say 10lbs. to 15lbs. per day, with advantage, but where the horses have been permitted to eat as much as they liked fatal results have followed. Of the three types of silos—the pit, the stack, and the overground or tub silo—the last is the best. However much wealth the farmers of this State as a class possess, there is very little increase in the amount of ensilage made each year, and if the Government were to offer to erect a dozen silos in different parts of the State I believe the offer would be readily taken advantage of by the farmers, and it would stimulate interest in this most important matter. It is interesting to note the chemical changes which take place in the making of silage. The crop intended for ensilage should be cut while green and succulent, and whereas in the case of hay the idea is to prevent fermentation by drying, in the case of the crop cut for ensilage the object is to induce fermentation up to a certain point, but to control it. Fermentation produces an increase of temperature. This causes great bacterial activity, and fermentation proceeds more rapidly up to about 125°. When the mass has reached about 140° some of the organisms which have carried on the fermentation are destroyed, and at 155° to 160° all are destroyed, fermentation ceases, and cannot begin again until air is allowed access to the mass. Thus the object of filling a silo slowly can be seen. If the first layers are not compressed too quickly, fermentation takes place rapidly; then when the fermentation of the first layer is over, more weight is added, which excludes the air and preserves the fodder." The writer then read extracts from the *Journal* in support of his opinion that it would pay farmers to make ensilage very much more extensively for sheep and other stock.

MAGPIES.—Discussion on the damage done locally by the black and white magpies took place. Members were of opinion that liberty should be granted to destroy this bird.

POTATOES.—Mr. Vince was of opinion that some of the potatoes said to be affected with Irish blight were in reality only soft through being forced with too much manure and water. He had grown clean potatoes from seed which was said to be affected. [The summer months are quite unfavorable to the development of Irish blight, and the real test will come in a few months' time, when cold and wet conditions prevail.—ED.] Mr. McLeod had a plot of ground which would produce good tubers, but they would not keep for more than two or three weeks, while a few hundred yards away was a plot on which a light crop of good keeping potatoes could be grown.

SOUTH-EAST DISTRICT.

Frances, March 23.

PRESENT.—Messrs. Brown (chair), Baldock, Meehan, Holmes, Pfitzner, Forster, Feineler (Hon. Sec.), and one visitor.

FERTILISERS.—Mr. J. C. Brown read a paper on this subject to the following effect:—"I have been cultivating the soil in this part for a good number of years before fertilisers of any kind were known here. We merely broadcasted the grain over the land and harrowed it, yet the wheat delivery at Frances far exceeded the present year's delivery. At that time the delivery at our little Frances Railway Station averaged from 15,000 to 20,000 bags of grain per annum; but the trouble was that this land did not give a payable return after three years' successive cropping, and so folks sold out and went to fresh fields and pastures new. Some of those who stayed here made use of the Naracoorte Caves guano, of which at that time there was an immense quantity to be had merely for the expense of raising it out of the caves and the cartage to the farm. This guano was

either sown on the land by hand or with the seed-sower, as drills at that time were practically unknown. The dressing of guano in most instances gave very satisfactory returns both in hay and grain crop, namely from two to three tons per acre, and from 20bush. to 25bush. wheat per acre—the amount of guano used varying from one bag to three bags per acre. After a few years, however, the demand became so great for the guano that the supply gave out. And the next fertiliser farmers turned their attention to was bonedust and Kangaroo Island guano. On my land I sowed lewt. to the acre, sowing them in separate paddocks broadcast, and the grain broadcast; the result was a heavy yield in both paddocks, but of the two Kangaroo Island guano gave the heaviest. Soon after Thomas phosphate came on the market, and as it was so much cheaper than bonedust, I was anxious to try this fertiliser, and sowed 100lbs. of this to the acre mixed with 100lbs. sand broadcast on 20 acres of land; and on another 20 acres alongside this I sowed 100lbs. bonedust broadcast to the acre. The result from the Thomas phosphate was unsatisfactory, there being a very poor yield in comparison with the bonedust land. I again used Thomas phosphate later on with the drill, putting one bag to the acre, with very poor results, and so I considered it unsuitable for this kind of land. I have used the following superphosphates:—Bone and super., mineral super., S.A. super., Adelaide super., Lawes' super., Florida super. and bone, Mount Lyell bone and super., and have found them much the same, with the exception that with Lawes' superphosphate the crop was taller and appeared thicker. There are, however, two drawbacks to the use of this super.—the bags become very rotten and are difficult to handle, and if the weather is damp the manure becomes very pasty. In applying these fertilisers to the soil I have mostly gone on the old lines of drilling the 80lbs. or 100lbs. per acre in with the seed; but I am of opinion that this is a mistake, for I have sown 1½bush. of wheat to the acre, and I do not believe more than half of it came up. My sons thought I was pickling the wheat too strong, but I am quite sure this was not the case, but that the super. had injured it in some way. My opinion was strengthened when one day, running out of pickled wheat and wishing to finish the piece of land, I sowed 2bush. wheat without pickling it, and it grew no thicker than the prepared wheat. I believe we should apply 100lbs. of super. to the acre, or even a little more, sowing 50lbs. to the acre with the wheat, and another 60lbs. or so on the surface by taking off the hoes. Three years ago I drilled in a small paddock of 11 acres, drilling in 50lbs. with the seed, and crossed it again with the hoes off, and letting the super. fall on the surface, then another 50lbs.—harrowed it once over. The result was a good hay crop—something like 30 tons off the 11 acres. This land had been cropped four times previous to this. I believe by distributing super. on the surface and harrowing, we give the roots a better chance to feed on it. The extremely wet seasons for the last three or four years have made farming in these parts very unsatisfactory, and my experience has been that when once the land is soddened with water that it is best to sow the grain broadcast, and the manure with the drill, letting it fall on the surface say 100lbs. to the acre, and then harrow. The result in two out of three cases will be satisfactory; in fact, I think it wise to do all sowing of grain and manure broadcast after May 24th, and you will rarely find a total perishing of the grain should there be a heavy fall of rain immediately after sowing. I might mention that I set a man to drill in five acres of wheat one day, and I set the machine to sow 80lbs. super.—as I thought—but had set, it seems, for over 180lbs. to the acre. However, the yield was a poor one; too much of the grain was either burnt, or checked somehow from growing as it should." The paper was well discussed. Prior to using the drill Mr. Holmes had best results from Thomas phosphate, but with the drill Lawes' super. had done best. He agreed with Mr. Brown, that in this district much of the grain was injured by contact with super., especially if it remained in the soil any length of time before germinating. He thought 80lbs. per acre quite sufficient; in fact, he had quite as good results from the application of 50lbs. per acre. Mr. Brown's suggestion to apply some as a top-dressing was well worth trying. Mr. Forster stated that he took the hoes off his drill to let the seed and manure fall on the surface, harrowing to cover it, and had better results than from where he drilled seed and manure into the soil. Members wished to have information as to soil analyses. [See note in Kadina report in this issue.—Ed.]

Kalangadoo. February 12.

PRESENT—Messrs. Crouch (chair), McColl, J. and R. Boyce, Hunt, Tucker, Ellison, and Sudholz (Hon. Sec.).

IMPROVEMENT OF PASTURE LANDS IN KALANGADOO DISTRICT.—Mr. Tucker read the following paper on this subject:—"It may be wondered why I take this subject in such

a naturally well-grassed district as this, but although we generally have an abundance of feed the question is can we or can we not improve the quality of our pasture, and also the quantity? This district being a very wet one, the feed is of a rather poor quality, and I have no doubt that most of you have found that it is only at one time of the year that stock can be successfully fattened on the natural grasses, viz., in the latter part of the spring and early summer. After this the grass becomes very dry and harsh, and stock do not care for it. I have seen sheep slowly starve to death in a paddock containing dry grass over 1ft. high; not for the want of sufficient feed, but because of the poor quality of it. Sometimes we have diseases appearing in stock, such as worms and bottlejaw in sheep and dry bible in cattle. I have read a great deal about this latter disease, but in my opinion it is caused by the poorness of the feed. This sets up indigestion, which in stock, as in human beings, is slow starvation. How are we to improve our pastures, especially during the later summer and autumn months? We might do this by the cultivation of grasses and other kinds of summer crops. Cultivation at all times greatly improves the quality of pasture, whether grasses are sown or not; but where grasses have been sown and cultivated very good results have been obtained. I feel sure that before many years much more land in this district will be sown with cultivated grasses, which, with proper care, grow very well indeed and pay well for the trouble. The grass which comes up almost everywhere after the land has been broken up, and which we commonly call spear grass, was at one time very little thought of, but now it is found to be one of our best grasses. It appears with the first rains and supplies a fine lot of feed during the winter months. It also makes very good hay if cut green. Another grass which grows well here is broom grass. Very like the other in its habits, a really good winter grass, grows very freely in almost any kind of soil. Yorkshire Fog does well in this district. It is thought by some to be of poor quality, but on soil of a damp sandy nature it will be found a really good feed. It will stand a long time in the land, and will keep green nearly all the summer. The splendid quality of all kinds of clovers is known to all. Shanclover is readily eaten by all kinds of farm stock, whether it be green or dry. It is of a very fattening nature, makes good hay and grows well locally. The grass which has done best of all with us is rye grass. It grows well in the better parts of our district, and gives an abundance of fattening feed. There are many other kinds of grasses which do well, such as cocksfoot, white prairie, and rib grass, which would all help towards the improvement of our pasture lands."

Mr. Tucker exhibited samples of several of the grasses mentioned in his paper, and a good discussion of the subject followed. The Chairman spoke very highly of Shanclover, and thought if extensively grown it would be the making of the district. Mr. McColl was of opinion that fog grass was of little value as a fattening food.

Kybybolite, February 24.

(Average annual rainfall, 22in.)

PRESENT.—Messrs. Bradley (chair), G. H., W., and O. Hahn, Farrow, Scholz, Wilson, Scott (Hon. Sec.), and four visitors.

POULTRY AND LAYING COMPETITIONS.—Mr. W. Day (Poultry Superintendent at Roseworthy) gave an address on this subject. He said that as the result of laying competitions a better class of bird was being produced and kept all round. The ordinary farm hen would lay about 80 eggs in a year, while competition hens averaged up to 200 each in the same period. Chickens should be well fed and looked after, but should not be coddled up in any way. If a chick had to forage for itself it was liable to be stunted in growth. It was as important to give proper attention to chicks as it was to get a good laying strain of hen. When the first competition was held the average price for eggs was 8½d. per dozen. At the last competition the average price was 11d. per dozen. A man should get the best stock possible, and from time to time select the best birds and only breed from them. White Leghorns to-day held the laying record, probably because selection had been carried out longer with them than with other breeds. One objection to this breed had been the number of cockerels hatched, but as these were now easily exported at a good price, that difficulty was overcome. Hens should not be kept for more than two years, as they did not pay if older. When two years old birds could be sent to the canning factory. Penned birds returned higher profits for the minimum outlay than those running out in paddocks or large yards. Feeding as carried out at Roseworthy could be followed by practically every farmer. The morning mash was two parts of pollard to one of bran—mixed with meat meal soup or stewed rabbit broth,

The allowance was from 3ozs. to 5ozs. per bird. At noon about 2ozs. per head of green feed, such as kale, rape, lucerne, &c., was given, and in the evening grain, principally wheat, allowing about 2ozs. each bird. It was possible to keep in this way about 1,400 birds to the acre, and they should return £500 per annum more than the cost of feeding. He considered the best birds for the farmers were Orpingtons and Wyandottes.

Mount Gambier, March 12.

(Average annual rainfall, 31½in.)

PRESENT.—Messrs. Sasanowsky (chair), Dow, Pick, Ruwoldt, Sutton, Holding, Watson, Wedd, Innes, Pritchard, Niquet, Buck, Kennedy, Kilsby, Schlegel, Major, G. and D. Collins (Hon. Sec.).

RICH AND POOR LANDS.—A letter from the Superintendent of Agriculture in the South-East on the question of the relative value of grasses and cereals grown on poor and rich lands was received. In this letter Mr. Colebatch quoted figures showing the analyses of samples [These were printed in March *Journal*.—Ed.], and the letter continued—"It is generally held that fodder grown under unfavorable conditions contains less amide nitrogen, but if the present conception of the nutritive value of this form of nitrogen be correct there is no advantage in this. In reading the above analyses it is important to note that both specimens of fodder were gathered at one and the same stage of maturity. It is essential to point this out, inasmuch as the amounts of water, ash, fat, and albuminoid decrease, while the amounts of carbohydrates and crude fibre increase as the grass grows older. The above practically sets out all that is known at the present time in regard to the question. Bulk for bulk, the fodder grown on good land is superior to that on poor land, and acre for acre gives even a greater difference in favor of the former. On rich land—that is, land which will grow maximum crops of grass or cereal—no material difference in composition can be expected to follow the application of different quantities and qualities of fertilisers; but on land capable of producing only inferior crops the effect of fertilisers is undoubtedly to improve the quality of the produce. There can be no question that the application of phosphatic manures has assisted in some measure in the improvement of 'rickety' pastures by increasing the phosphatic constituents in the herbage. Your reference to the practical value of oaten chaff from poor land as against that from rich land can probably be met by the view that in both cases the crop has been approximately a maximum one, and in that case, as mentioned above, no appreciable difference will be observed." Mr. J. Botterill, speaking of the question under discussion, had asked a great many about it, and they could give him no decided answer. They admitted that in the case of grasses those grown on rich land were better than those grown on poor land, but they could not say how it was in the case of hay. He got more straw from crops grown in rich land, but people preferred that from the poor land, holding that while the straw was less than from the other land the percentage of grain was greater. What he would like to have decided was that they should take a certain quantity of hay—say oats—grown on rich land, the heads included, and the same quantity grown on poor land, and find their relative values. Which was the most nutritious when chaffed? Which was the best when fed to stock? Mr. A. J. Wedd thought that, taking the price of the poor land and the price of the rich land, manuring them up to the same point, and adding the price of the manure, the poor land would be found to come up to the rich. The straw from the poor land was always finer than that from rich land, and stock preferred it. They generally preferred the poor land produce. He was not prepared to say why. Mr. G. Holding agreed in many respects with Mr. Wedd, and said the grain from poor land had a rich juicy appearance that they did not see in the other. He used to hear his father say that the stock liked hay grown on the poor land. Mr. H. Pick thought that the richer the land the more nutritious the grass on it. He would prefer the hay from the good land. He noticed that in his country the stock preferred the grass on the limestone soil to that on the flinty land. Mr. Botterill said that even in the rich lands of Moorak stock would prefer one part to another. They would eat the grass on one part bare, and barely touch another. Regarding Mr. Wedd's remarks, he believed that hay which grew luxuriantly on rich land might not be as sweet as that which grew with less luxuriance on poorer land, but the point he wanted settled was—Is there more fattening property in the stuff grown on rich land than in that grown on the poor land? He maintained that stock would fatten better on the rich land than on the poor.

Penola, February 12.

(Average annual rainfall, 26½in.)

PRESENT.—Messrs. Strong (chair), Ockley, Fullarton, McBain, Alexander, Peake, McKay, Wilson and Adamson (Hon. Sec.).

FEEDING OFF CROPS.—Mr. Ockley read an extract upon this subject. Members generally agreed that feeding off in this district was very beneficial to the crop, provided that the soil was sufficiently firm to stand it. If in a wet and boggy state the crop was generally very much damaged.

WHEAT FOR DISTRICT.—In answer to a question, members were unanimous in the opinion that Federation was the best all-round wheat yet grown in the immediate vicinity.

FRENCH WHEATS.—The Hon. Secretary tabled a sample of White Marvel, one of the French wheats grown for the department last season. This wheat, under very unfavorable conditions, yielded on his farm 15bush. per acre. He intended to give it a further trial this year.

Tatiara, February 16.

(Average annual rainfall, 19½in.)

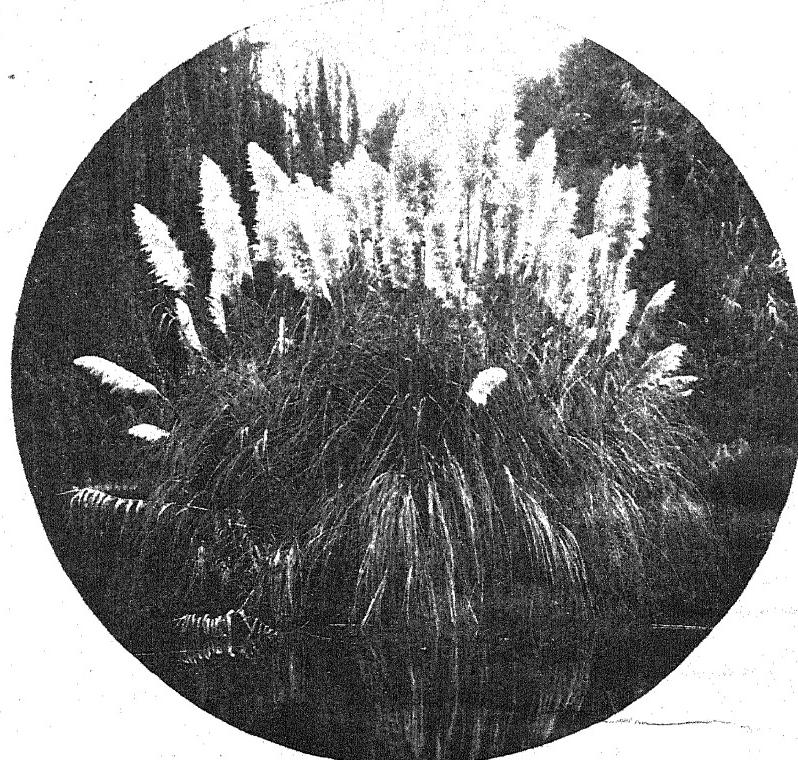
PRESENT.—Messrs. Saxon (chair), E. W., and H. Milne, Bond, Wilson, Staudie, Prescott, Campbell, Sutton, L. and A. Fisher, and Truman (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. E. W. Milne.

FARM ECONOMY.—Mr. E. W. Milne read the following paper:—“For the past few years the season has been favorable and prices have been good, so we have been tempted to go in largely for wheat production, and perhaps have neglected the little things as beneath our notice. There are many things that we might profitably grow that would help to keep things going while the main crops of oats and wheat are paying for our lands or swelling the bank accounts. I would advocate gardens, not on a large scale, but to grow fruit and vegetables for home use. With judicious use of manure and water we can grow most vegetables to perfection, and fruit too. Then we might grow peas, mangolds, rape, grasses, &c., so that more stock could be kept on small farms. There are little things about the farm which, if attended to, would save waste, and a penny saved is a penny earned. Thatching our stacks is a small thing, does not take long to do, but would often save a lot of good hay. I know that last year tons of good hay were lost through neglect of this small item, and I was one of the losers; but I learnt my lesson. Taking care of machinery may be a small matter, but it saves a lot of loss. Not only do I mean by putting it in sheds when not in use, which I consider an important item, but looking after it when in use, keeping bolts screwed and bearings tightened, and a judicious use of oil. I have heard that a pennyworth of oil saves 5s. worth of castings, and I believe that is true if put into the castings at the right time, but I have seen oil dripping off parts of the machine that are not bearings. I have seen a windmill, for instance, with the oil running down its four legs to the ground. I call that waste, and I do not like to see a machine in the paddock with the oil all over the woodwork. Some cannot be avoided, but this is one of the small things that may be looked after. I would also mention the greasing of harness and attention to loose straps and buckles. It is not profitable to find straps and buckles off when all ready to start ploughing. Another item I will mention, although it is perhaps not such a small item as some of the others, is the working of horses and machinery up to their capacity. For instance, if we have four horses, a plough and stripper or harvester that are capable of working 100 acres, and we are only doing 50, we are losing on our capital. I think the working of stock up to its capacity is the difference between loss and profit. Grading seed wheat is another small thing, but I believe a profitable point. If you will examine the two samples of wheat on the table you will see what we put into the ground with ungraded seed. I consider it is better to take the small grain out and feed pigs with it than to sow it in the ground to grow stunted wheat with small heads. I have an idea that this is partly the cause of so much short wheat amongst the other. Land is too valuable and wheat too good to sow waste and weeds in the wheat paddock.” Discussion followed, and the wisdom of carefully thatching stacks was acknowledged. In answer to a question Mr. Milne said that a difference in the crop was noticeable between that grown from graded and ungraded seed, although the extent to which it could be seen depended upon the season and other things. Other members considered that it was best to use graded seed wheat.

INSPECTING THE PROPERTY.—The visitors then inspected the property. A well-laid out flower garden was watered from a 96ft. deep well. The men's cabin was a cosy room built of sun-dried bricks. In the cowshed Mr. Milne's patent bails were inspected.

The patent consists of a piece of wire and a bolen resting loose on the top of the bail, just like a gate hoop. As the bail closes the loop rises and then falls over the bar, keeping it in position. The barn is a roomy place, and in the season is used as the shearing-shed. The stables are large, and have a passage behind the feeding troughs, and room for 12 horses. Mr. Milne has 10 good draught horses, and also some of lighter breed. Sheep, and cattle, and fowls of the barndoar, Wyandotte, and Andalusian types were seen. The chaffisher is large, and carries a chaffcutter and 4-power horseworks. The haystacks are near at hand, and are neatly thatched. One of the stacks had a wood-block bottom. A small stack of peas was waiting to be thrashed. The horse troughs are near by, and water is supplied from a storage tank which is filled from the well by means of a mill. The machinery shed is built of bullock and roofed with straw; wire netting is placed along the eaves to prevent the stock pulling at the straw. Near the flower garden were noticed two currant vines heavily loaded with fruit. One patch of lucerne grown without irrigation was dry and withering. The parts irrigated were green and stood quite 6in. high. The greenest spot visited was the fruit garden, covering about two and a half acres of ground. The trees and vines showed good and careful growth, and the trees in season were loaded with fruit. It was noticed that the birds were doing much damage, especially in the lower part of the garden, where starlings completely cleared all grapes from the vines, and other fruit also suffered. One tree near the house was bearing four different kinds of apples. A well-filled dairy, containing fruit and preserves, as well as eggs and butter, completed the inspection. Members were entertained at tea, and heartily thanked Mr. and Mrs. Milne for their hospitality.



THE JOURNAL OF AGRICULTURE

Published Monthly.

Subscription, 1/- per annum, including postage.

Circulation, 5,300 Monthly.

THE Journal contains information of an official character relating to the Agricultural Lands, Stock, and Produce Export Departments. Illustrated articles and paragraphs by Government experts dealing with all branches of agriculture, horticulture, viticulture, pastoral matters, dairying, stock diseases, poultry, etc., are published regularly.

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T. PASCOE,

MINISTER OF AGRICULTURE.

THE JOURNAL

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Department of Agriculture

OF SOUTH AUSTRALIA.

No. 10.

MAY, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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All communications to be addressed:

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T. PASCOE,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Roseworthy College Scholarships.

Each year the Government offers six scholarships, tenable for three years at Roseworthy Agricultural College. In order to give youths from the country a fair opportunity, the State is divided into six districts, a scholarship being offered for each. This year the scholarship examinations were held at Roseworthy College on March 31st and April 1st. Nine candidates submitted themselves for examination, and the Principal reports that on the whole they did well, only one failing to secure 50 per cent. of the total marks. On the recommendation of the Principal, the Hon. Minister of Agriculture has approved of the scholarships being awarded as follows :—District No. 1, W. F. D. Clark, of Knightsbridge ; No. 2, J. L. Thompson, of Mount Barker ; No. 3, G. V. Madeley, of Port MacDonnell ; No. 5, R. C. Scott, of Burra ; No. 6, J. C. V. Martin, of Port Pirie. There being no competitor in District No. 4, the scholarship has been awarded to the candidate gaining the highest percentage amongst those who failed to secure a scholarship in the district in which they competed. This is W. Driscoll, of Dublin.

Molineux Memorial Fund.

Subscriptions to this fund are not coming in as freely as the Advisory Board expected. Up to the present about £145 has been promised, but a majority of the Branches have not yet replied to the suggestion that each Branch should contribute £5 5s. to the fund. The amounts subscribed by the different Branches (including direct contributions) are as follows :—Mount Gambier, £11 11s. ; Port Germein, £5 10s. ; Kalangadoo, £5 5s. ; Clare, £5 5s. ; Wilmington, £5 2s. 6d. ; Pine Forest, £3 5s. ; Port Pirie, £2 15s. 6d. ; Arden Vale and Wyacca, £2 12s. 6d. ; Mallala, £2 5s. 6d. ; Kingscote, Renmark, Kingston, and Mochard, each £2 2s. ; Clarendon, £2 ; Carrieton, £1 18s. ; Quorn, £1 15s. ; Narridy, £1 12s. 6d. ; Caltowie, Millicent, Tatiara, Lameroo, and Cherry Gardens, £1 10s. ; Belalie North, £1 5s. ; Miltalie, £1 5s. ; Hawker, Minlaton, Arthurton, Morgan, Amyton, Lyndoch, Nantawarra, Wepowie, Colton, Appila-Yarrowie, Paskeville, and Lucindale, £1. Most of these latter amounts are the direct subscriptions of one or two members of the Branches mentioned. In addition to these several amounts of 5s. to 15s. have been received. The Advisory Board will be glad to hear from other Branches as early as possible in order that action may be taken to submit definite proposals to the subscribers. This of course cannot be done until we have some idea of the funds that will be available for the purpose.

The Trade Commissioner in London.

Major Norton, D.S.O., Trade Commissioner for South Australia, left by the s.s. *Sulolk* on April 27th on his return voyage to London. Since his return to South Australia Major Norton spent about twelve months in this State, and also visited the East to inquire into the prospects of trade with that part of the world. He expects to reach England about the second week in June. Mr. G. A. W. Pope, who has been acting as Trade Commissioner during Major Norton's absence, will probably reach Adelaide about the end of August.

The Farrer Fund.

For some time a movement has been on foot in New South Wales to raise a fund with the object of commemorating the work of the late Mr. Wm. Farrer, who for some years prior to his death on April 11th, 1906, was Wheat Experimentalist to the New South Wales Department of Agriculture. The committee appointed to control the fund are anxious to invest the money permanently, so that the interest may go towards a bursary for some farmer's son or other lad showing special aptitude for experimental work with wheat, to enable him first to study at one of the farm schools, and perfect himself more especially in wheat-farming; then to proceed to the Hawkesbury Agricultural College; and finally, it is hoped, to take advantage of the full course for B.Sc. in agriculture at the University. In order to give a thorough training to one student for seven years a capital sum of £1,000 is needed. The amount already raised is £300, and it is hoped that wheatgrowers and millers throughout Australia will assist in making the movement a thorough success. The amount to which it hoped to raise the funds is but a small fraction of the financial results which have followed Mr. Farrer's work. For many years Mr. Farrer carried on his work as Wheat Experimentalist at his own expense, and no man in Australia has done more to improve the quality of Australian wheats, not only from a milling point of view, but from the standpoint of their immunity to disease. Amongst some of the best wheats bred by Mr. Farrer are Bunyip, Comeback, Bayah, Firbank, Federation, Bobs, Thew, Florence, Nutcut, Rymer, Cleveland, John Brown, Jonathan, Cedar, Warren, Uppercut, Jumbuck, and Genoa. Contributions from South Australian farmers sent to the Director of Agriculture, Adelaide, will be forwarded to the committee in Sydney, and will be acknowledged in the *Journal of Agriculture*.

Deep Rooting of Wheat.

Mr. R. W. Peacock, Manager of the Bathurst (N.S.W.) Experiment Farm, records an interesting investigation into the lateral and downward growth of the roots of wheat. A strip of fallow, 5ft. 6in. wide, free from weeds, running between wheat plots, was selected for the purpose. An excavation was made

to a depth of 4ft., and water then sluiced on to the sides to wash the earth away and leave the roots exposed. Owing to the colloidal properties of the stiff clay encountered, the amount of soil removed was not large, but sufficient to answer the requirements of the investigation. From the crown of the wheat stubble to a depth of 3ft. 8in. wheat roots were exposed, and at the centre of the fallowed strip, 2ft. 9in. from the edge of each wheat plot, wheat roots were found in large numbers. The soil is a very stiff clay from 8in. downwards, and the deep rooting is attributed by Mr. Peacock to the roots following the cracks in the clay caused by dry weather. It was not possible to ascertain the full lateral development, as in the middle of the plot the roots from the wheat on either side overlapped. This lateral development of the roots illustrates one of the difficulties with experimental plots, as the wheat on the plot alongside fallow land can and is affected to an appreciable extent for a foot or more in width.

Wild Wheat.

The Secretary to the United States Department of Agriculture reports the discovery by Mr. A. Aaronsohn, of Hefia, Palestine, of a very interesting wild wheat which grows on the stony mountain slopes and in the clefts of rocks in the driest portion of Mount Hermon, in Eastern Palestine. This wheat grows over a wide territory, and is found at altitudes ranging from several hundred feet below sea level to 6,000ft. above, near the borders of the snow-fields. It is claimed that this wheat is the progenitor of our commercial grain. This point is one of great interest, as botanists have never been agreed as to the original source or parentage of our wheat. Seed of this new wild wheat has been obtained by the U.S. Department for use in crossing, in the hope of breeding strains of commercial value that will grow in dry rocky soils at present considered unfit for wheat production.

The Sins of the Magpie.

Our popular black and white warbler, the magpie, has of late come in for serious criticism from several quarters. The members of the Port Elliot Branch hold very strong views on the subject of the injury caused by these birds to strawberries and to newly sprouting crops of peas, maize, wheat, &c. While there can be no gainsaying the fact that these birds are extremely useful, there is at the same time no question that in some parts they are developing habits which are bound to bring them into conflict with producers. Not only have complaints been received from other quarters of damage to wheat, peas, etc., but several fruitgrowers have brought under notice damage to fruit crops. One writer states that he has watched the magpies settle in a fig tree and fly

thence to a tall red-gum with a fig in their beaks to enjoy a feed at their leisure. Another states that he has observed them attacking peaches, apples, and pears. While admitting their usefulness in other directions, growers are naturally disposed to take steps to prevent loss of fruit in this way.

Lincolnshire Curly-Coated Pigs.

In view of the fact that the Minister of Agriculture has approved of the importation of a small herd of this breed for the Kybybolite Experimental Farm, the following reference, taken from the *Murk Lane Express*, should be of interest:—“ Two pigs of the above breed, farrowed early in May, 1909, have been killed at Stickney, and the weights obtained are rather exceptional. The younger of the two—eight months and four days old—weighed 28st. 10lbs., and the other—nine months and one day old—killed out at 31st. 7lbs. (dead weight).”

Analyses of Arsenate of Lead.

Last year the Agricultural Department published the results of analyses of samples of each brand of arsenate of lead on the market. These figures showed a wide range in the constituents in the different samples. The New Jersey (U.S.A.) Experimental Station has also taken up this matter, and in some recently published analyses further proof is afforded of the necessity for legislation dealing with insecticides on the lines of our Fertiliser Acts. The New Jersey figures show the following variations:—*Water* from 39·06 per cent. to 68·16 per cent. ; *arsenic oxid*, 6·07 per cent. to 19·71 per cent. ; *lead oxid*, 21·13 per cent. to 40·08 per cent. ; *soluble arsenic*, 0·05 per cent. to 0·28 per cent. It will be seen from these figures that brands of what the orchardist would naturally assume to be materials of the same character varied to such an extent as to render it necessary to have a separate analysis of each as a guide to the quantity to use. It will be seen that one brand contained three times as much arsenic as the lowest, and even if it cost twice as much per pound it would be the cheaper.

Cutting up Large Estates.

Considerable areas of land in the best farming districts in the State are being cut up by their owners and offered in suitable-sized blocks. In addition to the large area of Canowie, which was offered a short time back, and nearly 40,000 acres of the Mount Schanck Estate recently allotted, over 20,000 acres of the Wirrabara Estate is being surveyed into between 40 and 50 blocks, while some 9,500 acres of the famous Booyoolie land is advertised for sale in 33 blocks of from 60 acres to 590 acres in area. This comprises some of the best land in the North, some of it being suitable for lucerne, and there is

no doubt that there will be keen competition for it. The Government has just completed negotiations for the purchase of over 22,000 acres of the well-known Struan Estate at £3 10s. per acre. This land will probably be available for allotment early next year.

Irish Blight in Potatoes.

Up to the present, possibly owing to the dryness of the autumn, no complaints have been received of any injury by Irish blight in potatoes in the late crops. In New South Wales and Queensland, however, there have been outbreaks of a serious nature during the past month. From the Upper Hunter (N.S.W.) reports indicate that the disease is spreading rapidly through the potato fields, and that losses will run into thousands of pounds. From Queensland also fresh outbreaks are reported from the south-eastern districts. In this State most danger is to be feared in ordinary seasons in the early crops, and growers who intend planting during the winter should make the necessary preparations for spraying with Bordeaux or Burgundy mixture. To be effective it is necessary to spray the plants before there is any sign of disease, and this operation must now be regarded as part of the regular work connected with the growing of early potatoes. Growers can obtain an illustrated pamphlet on Irish blight on application to the Secretary, Department of Agriculture, Adelaide.



Imports and Exports of Fruits and Plants.

During April 5,444bush. of fresh fruits, 12,317 bags of potatoes, 60 bags of onions, and 58pkgs. of plants were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act. Seven hundred and sixteen bushels of bananas (being chiefly over-ripe), and 49 bags of potatoes were destroyed. The exports to inter-State markets comprised 8,948bush. of fresh fruits, 3,212 pkgs. of vegetables, and 36pkgs. of plants, also examined at Adelaide. In addition, 852bush. of fresh fruits at Coonawarra, 154bush. at Wirrabara, and 1bush. at Stirling North were inspected and passed by the inspectors at those places. Under the Commerce Act, 43,384 cases of fresh fruits, 37pkgs. preserved fruits, 6pkgs. dried fruits, and 98 pkgs. of honey were exported to over sea markets during the same period. These were distributed as follows:—For London, 20,441 cases apples, 1,139 cases pears, 22 cases quinces, 132 cases grapes, 5pkgs. dried fruits, 7pkgs. preserved fruits, and 95pkgs. of honey; for Germany, 17,678 cases apples, 190 cases pears, and 3 pkgs. honey; for India and East, 2,565 cases apples, 4 cases pears, 20 cases grapes, 5 cases preserved fruits, and 1 case dried fruit; for New Zealand, 1,034 cases grapes, 24 cases lemons, 25 cases preserved fruits; South Africa, 130 cases apples and 7 pkgs. plants. Under the Quarantine Act 1,973 pkgs. of plants, seeds, bulbs, &c., were examined and admitted from oversea ports.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

OPHTHALMIA IN SHEEP AND CATTLE.

"Johnsburg" writes—"I should be glad to receive information as to the treatment of an eye disease, which is very prevalent among sheep and cattle. The trouble begins by what appears to be a scum growing over the eye, which gradually forms a lump in the very centre of the eye (similar to a wart), and the beast is evidently in much pain and loses flesh. It affects sheep from shearing time till now, and sheep often go completely blind."

Mr. J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon), replies—"The eye trouble amongst the sheep and cattle is evidently a form of contagious ophthalmia. Affected animals should be isolated, as the disease is spread by agency of flies, other insects, &c. In the early stages the following eye-lotion should be used:—Sulphate of zinc, 32grs.; tincture of opium, 3 drachms; add water (8ozs.), and mix. Apply with a clean feather or dropper, twice daily. When white scum appears over the eye, the centre of the scum should be touched *once only* with caustic stick (nitrate of silver), and follow with a solution of nitrate of silver—3grs. to the ounce. Apply daily with a feather or dropper."

"GARGET" IN COWS.

"Salisbury" asks for particulars as to treatment of the disease known as "garget" in cows.

Mr. J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon), replies—"The treatment of the disease 'garget' or 'mastitis' will depend, of course, on the character of the attack. Generally speaking, 'mastitis' is produced by an entrance of pathogenic organisms into the udder; the best results have been obtained by using injections of a 4 per cent. solution of boracic acid into the affected quarter. The animal should first receive a purgative consisting of 1lb. Epsom salts and 1lb. treacle dissolved in 1½qts. of water. The udder should be carefully cleansed with warm water, the syringe (one can be obtained locally) should be sterilised, and the hands should

be cleansed thoroughly. The solution should be about the temperature of the body, and from 10ozs. to 12ozs. should be injected into the affected quarter twice daily after milking. Care must be taken to introduce the fluid slowly, so that it will reach all parts of the quarter, and the parts should be massaged during the operation. The solution may be left in quarter for a few minutes, and then withdrawn in the usual manner. This treatment entails some trouble, but good results usually follow. Preventive treatment consists in strict cleanliness at the time of milking—clean hands, udders, teats, and quarters, clean milking sheds; all abrasions and bruises of the udder should be immediately attended to. A cow affected with ‘garget’ should be isolated from other cattle.”

STRINGHALT IN HORSES.

“Subscriber” wishes to know how to treat a young horse. “It was running in the paddock and was apparently all right till about four weeks after, when I noticed it was very bad with stringhalt. Another horse running in the same paddock was affected similarly.”

Mr. J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon), replies—“These may be cases of stringhalt, but the history is peculiar. No treatment can be recommended for these cases. Should further cases occur an investigation will be conducted.”

MANGE ON HORSE.

“E. G. V., Brentwood,” asks for opinion regarding horse which is losing all his mane and tail hair. In other respects the horse seems to be healthy. I have looked carefully and cannot see any lice or insects.”

Mr. J. F. McEachran, M.R.C.V.S. (Government Veterinary Surgeon), replies—“The case appears to be one of ordinary mange. Wash affected parts thoroughly with soap and water, dry, and then rub in the following lotion:—Powdered sulphur, 3ozs.; oil of tar, 3ozs.; raw linseed oil, 4ozs. Leave lotion on for three days. At the end of the third day wash off, dry, and re-apply. Two applications usually suffice. As mange is contagious, the harness, &c., should be washed before using on other horses.”

CRACKED HEELS.

“W. L.” writes—“One of my horses is suffering from a complaint which causes dry sores just above the hoof, extending from the front around the inside to the back, beneath the joint. The skin appears rather tender. Is this thrush? Can you advise treatment?”

Mr. J. F. McEachran (Government Veterinary Surgeon) replies—“From the description given I should say this was a case of cracked heels and not thrush. I would recommend dusting once or twice a day with powder consisting of equal parts boracic acid, oxide of zinc, and chalk. Cleanliness of the parts affected is absolutely necessary.”

FARMERS' FRIEND WHEAT.

H. T. Wittwer, Parrakie, is desirous of obtaining a few bushels of Farmers' Friend wheat. This variety, though at one time fairly popular, is now but little grown. Any reader possessing a small quantity of this wheat would oblige by communicating with the writer.

BLINDNESS IN FOAL.

J. Hoskins, Wilmington, writes—"Two years ago a draught mare, seven years of age, reared a foal to the age of 11 days, when it died. One year ago she reared another to the age of three days, when it died. Last November she dropped a filly foal, which appeared healthy and sound for about one week, after that it showed signs of stupidness. On examination I found a white scum in the centre of the near eye, and the following week the off eye showed a similar object, and the foal showed signs of blindness. The scum spread all over both eyes, and has lately turned a bluish color. My belief is that the foal was blind a week after it was dropped. If I move my hands to and fro before the foal's eyes no notice whatsoever is taken—ample proof that the foal is blind. It is now 18 weeks old, and appears to be doing well."

Veterinary Surgeon Desmond replied as follows—"Nothing can be done in the way of treatment for this foal. On no account should you breed from this mare again. The eyes having a blue appearance denotes troubles which are deep-seated; this is the internal structures of the eyes which are affected. If the outer coats of the eye were affected they would be of a whitish color."

ASPHALTING CONCRETE VERANDAH.

A Northern Branch of the Agricultural Bureau asks the best way to asphalt a verandah on the top of sand and lime concrete.

The Superintendent of Public Buildings supplies the following information:—"Simply pour tar over the surface, broom it over, and let it soak in. After, say, a week, or even less, give it another coat, and spread some sand over same while still fluid—just enough to soak up the tar. This will make a good surface."

SHOULD HORSES HAVE FREE USE OF WATER-TROUGH DURING MEALTIME?

"R. C." Port Broughton, writes—"Is it harmful or beneficial to allow horses to have the free use of the water-trough during mealtime and all other times while in the stable?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"It is quite usual to allow horses to have free access to water during feeding and at all other times while in the stable, and there is practically no danger in the practice. Under such conditions horses drink very small quantities of water. When horses have not free use of water as described, they should be watered before—and not immediately after—feeding."

AGRICULTURE IN OTHER LANDS.

Professor Perkins (Principal of Roseworthy Agricultural College), who is at present on a holiday tour, has arranged to furnish from time to time notes descriptive of the agricultural conditions of the different countries visited. The first of these is written from Cairo on March 20th, and deals with Egypt, in which country he spent about four weeks.

EGYPT.

The feature which must most strongly impress the visitor interested in agricultural matters is that rural Egypt is one vast object lesson to the irrigationist. Here is a country that is to all intents and purposes practically rainless supporting, nevertheless, a flourishing rural population ; and which, if we except the Suez Canal and the much-fleeced tourist, is wholly dependent for its revenues on the agricultural produce of the soil. The total area of Egypt proper is given as about 400,000 square miles, the great bulk of which is a barren waste, carrying not a vestige of vegetation from one end of the year to the other. Of this area in 1909 there were about 6,500,000 acres under cultivation—4,000,000 acres in the Delta and about 2,500,000 acres in the narrow Valley of the Nile. It is calculated that the raising of the Assouan Dam will have the effect of winning over from the desert an additional 1,000,000 acres. By themselves these figures convey but an inadequate image of the facts as they may be observed here—on the one side an absolutely desert waste, and contiguous with it a few million acres of marvellous fertility, the productiveness of which cannot probably be matched anywhere else in the world. One cannot describe cultivated Egypt better than by the statement that it has all the appearance of a huge vegetable garden, from every corner of which the utmost is extracted by the industrious cultivator.

This great productiveness Egypt owes, as is well known to everybody, to the Nile both indirectly and directly. The Nile in the course of ages has built up a soil of great fertility, which it continues to enrich and supply with all essential moisture at the present time. I had imagined that there must be in Egypt some form of unirrigated agriculture practised. I am informed, however, that, apart from a few sandy acres occasionally sown to barley in the neighborhood of Alexandria, this is not the case. That this should be so will readily be understood when it is stated that, with a very high average temperature, the rainfall at Alexandria to the north of the Delta is about 8in., whilst that of Cairo at its southern apex is only 1in. Agriculture, therefore, in its widest sense appears to be possible only on such lands as come within the reach of the Nile waters.

The complete absence of rain both in winter and summer renders necessary the use of irrigation waters for both winter and summer sown crops. In former times, apart from a very limited area of country in the immediate neighborhood of the river, the growth of winter-sown crops was all that was possible in Egypt. The flood-waters of the Nile were periodically intercepted in huge protected basins, where they deposited a rich silt, besides saturating the land with moisture. After a stay of 50 days to 60 days the flood-waters were withdrawn, and in the mud were sown the winter crops of corn, beans, &c. No summer crops were possible, as a falling Nile made summer irrigation impossible. This is the practice that is still known in Egypt as basin irrigation, and which is still in force over the greater portion of Upper Egypt. Towards the beginning of the nineteenth century the first steps towards what is known here as "perennial" irrigation were taken. The two main branches of the Nile were dammed back some 12 miles north of Cairo, and suitable canals were made to supply a continuous flow of irrigation water from one end of the year to the other. At the present time "perennial" or "continuous" irrigation is practised throughout the Delta, whilst the Assouan Dam will soon render it possible over the bulk of Upper Egypt.

The average temperature in Egypt is high, and the growth of plants therefore exceedingly rapid when within reach of an adequate supply of moisture. It follows, therefore, that wherever "perennial" irrigation is possible the Egyptian soil is made to yield two crops in one year; and as the value of the summer crop is usually considerably in excess of that of the winter crop, it is calculated that the possibility of "perennial" irrigation more than doubles the productiveness of the land.

In a country in which regular agricultural statistics are not kept it is exceedingly difficult to form an adequate idea of general values and returns. The rental values of agricultural land will give a very fair idea of the value of the land. For good cotton land I find that as much as £12 and £14 an acre is paid annually in rent, whilst relatively poor land pays as much as £3 and £4 an acre rental. In the neighborhood of cities where vegetables are raised as much as £20 an acre are paid in rent. Where cotton cannot be grown rents are lower. No statistics existing on the subject, I found it difficult to secure an approximation as to the average rental throughout Egypt; authorities appear to differ in the subject between £3 and £6 an acre. If we take £4 as a fair average, this represents an average value of £100 an acre for agricultural land—a figure which cannot, I think, be approached anywhere else in the world.

The principal direct tax in Egypt is the land tax, which varies according to districts and quality of soil, but which averages out at about £1 an acre throughout Egypt. It is right to state that no charge is made for the supply of irrigation waters, towards the cost of which the land tax contributes.

As Australians, it is as well that we should recollect that without irrigation all this land is absolutely worthless, and that the possibility of using water raises the value of 7,000,000 acres of otherwise valueless land to an average of £100 an acre, and perhaps more.

In Egypt the crop which dominates all agriculture is the cotton crop, and wherever "perennial" irrigation is possible all other crops become subsidiary to it. The area under cotton has risen steadily within recent years. In 1893 it was represented by 966,000 acres, and in 1908 by 1,641,000 acres; in 1893 it occupied 15.21 per cent. of the total area under crop, whilst in 1908 it occupied 21.59 per cent. of the same area. There is no doubt, too, that with additional facilities for summer irrigation in Upper Egypt the area under cotton will be still further increased. Within recent years, however, notwithstanding the increase of acreage under cotton, local authorities have been faced with the disquieting feature of steadily decreasing outputs, implying a shrinkage in yields. So serious does the position appear that a special commission has been appointed to inquire into the question. Insect pests would appear to have contributed somewhat to this decrease in yields. From what, however, may be observed currently, abuse of irrigation and insufficient attention to drainage would appear to be at the root of the evil. The water supply has apparently been very abundant latterly at critical periods of the year, and the anxious grower has been unable to resist the temptation of giving his plants more water than is good for them, with the result that the soil is absolutely sodden and waterlogged, rendering impossible healthy root action. An additional consequence of this excessive irrigation is the appearance of salt patches where they had never been known before. I was at first puzzled to account for the apparent failure of lucerne in Egypt; I was told that it would not grow in summer. But with land at its maximum of saturation at this time of the year it is not difficult to realise why lucerne should not succeed.

The Irrigation Department appear to supply ample drainage channels for the removal of the surplus waters. These channels, however, must remain more or less ineffective so long as they are not adequately fed by a huge network of well-kept private drains, drawing off regularly and to a proper depth the salt-laden waters of the sodden fields. The impression one gets, even at this time of the year, is that drainage is very much neglected by the average cultivator; and that unless energetic measures are speedily put in hand to remedy this defect there will be a still further decrease in cotton yields in the near future. It might be added that it will be well if Australian irrigationists keep these facts steadily in view.

Next to cotton in importance—indeed, excelling it in area, if not in value—comes the maize crop, which in 1908 occupied 23.69 per cent. of the area under crop. It is grown very largely as a catch crop late in the summer, either after wheat or more frequently after late clover.

In third rank comes the *Berseem* or Egyptian clover (*Trifolium Alexandrinum*), of which there appear to be several local varieties. Although it is mainly grown as a catch crop, it is in many respects the stand-by of the Egyptian agriculturist, whose live stock are fed on "berseem" almost exclusively for six months of the year. One cannot help but being impressed with the luxuriant appearance of "berseem" fields at this time of the year; and as it is possible that either as an ordinary catch crop or as winter fodder on the Murray irrigation settlements "berseem" may prove of value to South Australia, I append a few notes on its treatment here. I have also made arrangements for the forwarding of some fresh seed during the course of the year.

"Berseem" appears to be generally treated here as a catch crop; that is to say, the soil in which it is sown receives no special preparation. It is sown in the autumn of the year between mid-September and mid-November, and frequently in a standing summer crop that has not yet been completely harvested, such as cotton, maize, dura, &c. The rate of seeding has been stated to be about 40lbs. to the acre, representing something like 10s. in value. From personal experience with similar seed, I should look upon such seeding as excessive, and imagine that with fresh seed 20lbs. should prove ample. "Berseem" is always sown in land that has been recently flooded, and the seed germinates almost immediately. It is generally irrigated two or three times before the first cut, which will take place within 45 days to 60 days of germination; the young plants are allowed to shoot out again before flooding, and the second cut may be taken within 45 days of the first; later on a third and even a fourth cut may be taken at equal intervals of time. The first cut is very succulent, and later cuts drier and more nourishing. The last cut is frequently left for seed. All the live stock of the country appear to be kept on "berseem" during the winter and spring months; and I can testify to their condition being on the whole fair, which, I am informed, is not the case during the summer months when no "berseem" is available. Bullocks, buffaloes, asses, &c., are tethered out in the miniature fields, in which a circle of "berseem" is cut out for them for feed. In no cases did I notice the live stock trampling down this luxuriant growth, although I am informed that it is sometimes done. In the neighborhood of cities "berseem" is cut and carted on the backs of camels for the benefit of city horses. I was told that one acre of "berseem" would in one cut provide feed for 100 working bullocks for one day, and that from half to three-quarters of an acre of "berseem" would keep a working ox for six months.

"Berseem" favors heavy ground, but requires good drainage to give best results. In Egypt it grows well in winter, running to seed in spring. If cotton follows "berseem" the ground is broken early; if maize follows it, the soil is broken late.

In fourth rank comes wheat, which in 1908 was represented by 15·38 per cent. of the total area under crop, as against 20·42 per cent. in 1893. Wheat indeed appears generally to have fallen out of favor, and Egypt, once the granary of Rome, is now a wheat-importing country. What crops of wheat I was able to see were, according to my ideas, very rank, and open to lodging and red rust; these accidents, however, I was informed, were not to be feared. I saw some grain at the native markets; it was, however, poor and ill-grown. By comparison with local wheat, and indeed with imported wheats, I have heard a shipment of South Australian wheat (1907) very highly spoken of. No statistics as to yields are collected; I am informed, however, that the average is probably between 20bush. and 24bush.

Next come beans, then barley, then rice, then sugarcane, which is almost exclusively confined to Upper Egypt, and a few other minor crops.

In the distribution of crops grown some attention appears to be paid to a proper system of rotation; and where the growing of cotton is possible, the rotation adopted is one meeting the requirements of this crop. Formerly a three-year rotation appears to have been in general use; that is to say, a rotation in which cotton appeared once in three years. This, however, appears to have been abandoned latterly in favor of a two-year rotation; indeed, in some few instances cotton appears to have been grown several years in succession, which may be one of the contributing factors to the decrease in yields.

The three-year rotation was arranged somewhat as follows:—

First Year.—Clover in winter, followed by cotton in summer, in the standing plants of which clover might again be sown in early autumn.

Second Year.—Or else beans are sown, followed by maize in summer.

Third Year.—Wheat, followed by maize in summer.

The two-year rotation most in use at the present time appears to be—

First Year.—Clover in winter, followed in summer by cotton.

Second Year.—Beans or wheat, followed by maize in summer.

Whatever the practice adopted it will be noted that the land is kept always under crop. There is no doubt that this fact, by keeping in check surface evaporation, must do much towards minimising the danger of the rise of salt.

I was anxious to ascertain how tenants could make two ends meet after paying the high rents already alluded to. For the purpose I asked the manager of a large estate (Mr. T. L. Smith, of Constantinia) to give me his views of the case. These I reproduce below as closely as I am able.

According to Mr. Smith, the tenant looks to his cotton crop to pay his very high rent, whilst all other crops represent his personal profits, after deduction of working expenses. He took as an example an area that could conveniently be worked by a pair of oxen, namely 20 acres; of this area 8 acres would be sown to cotton, 6 acres to wheat or barley, and 6 acres to rice, whilst the bulk of the area would carry "berseem" in winter, except the area under wheat. For these 20 acres the tenant would pay about £80 rental.

The 8 acres of cotton might yield him $3\frac{1}{2}$ cantars (= about 99lbs.) an acre. Locally within the last 10 years the value of the cantar of cotton appears to have fluctuated between £2 and £5 ; at £3 10s. this would represent per acre £12 5s., and a total of £98 for the 8 acres under crop, that is to say an appreciable excess over the rent paid for the 20 acres of land.

The 6 acres under wheat would yield 20bush. to the acre, which at 5s. would return £30.

From the 6 acres of rice might be expected three-quarters of a ton per acre at £4 a ton, representing a total of £18.

Thus the gross returns from the 20 acres might be summarised as follows :— Cotton, £98 ; wheat, £30 ; rice, £18 ; total, £146.

The £66 in excess of the rent would represent the tenant's return for his labor, in addition to what profit might be derived from the clover, which would be much in excess of the requirements of his live stock ; together with a crop of maize which might be taken after the wheat.

It should be noted that in Egypt the fellah lives exceedingly cheaply, and that field wages are correspondingly low ; men receive between 10d. and 12d. per day, and women between 5d. and 8d. per day. From one point of view their work is apt to be slow, and stands in need of much supervision ; thus one pair of oxen does not plough here more than half of an acre a day. One cannot, however, help admiring this sturdy race of country toilers, with their helpmates as erect as young poplars ; indeed, there is many a piece of field work that I have examined here that would have taxed the skill of the most expert European farm-hand to equal. If the Egyptian farm laborer needs driving when working for others, his toil and industry are unremitting when working for himself.

What farm implements and tools are in use are exceedingly primitive ; chief amongst them appears to be the "fass" a heavy triangular hoe, with which the bulk of the field work is done. The Egyptian plough is the old Roman plough, still in use in India and Southern Europe ; it has a heavy wood body, to which is attached a strong cultivator tine, which is made to tear through the ground, frequently to considerable depths. The soil is merely ridged, the sod not being turned ; and the work to be effective must be followed immediately by a second ploughing given at right angles to the first.

Another useful Egyptian implement is the "cassabia," or levelling scoop, essential to a race of irrigationists. The fellah handles this levelling scoop admirably ; with the aid of his eye alone he is able to level off perfectly his seed-bed.

The native threshing implement consists of a series of revolving discs fixed to a sort of cart, which is dragged over the stalks of corn by oxen, both chaffing the straw and treading out the grain in one and the same operation. It is this chaffed straw which so inefficiently succeeds "berseem" as the summer feed of live stock.

Fortunately for Egypt its system of irrigation does not involve any high lifting of water. The highest lift known on the river was stated to be about 60ft. In the majority of cases, however, at flood times the water flows over the channels, and floods the prepared areas; at the outside there may be a lift of 4ft. to 6ft., which is carried out by native water-wheels and Archimedean screws. There are many, however, who think that it would have been better policy to force the fellah to raise his water to greater heights. This would have forced upon him the use of a greater number of draught stock, the manure from which would serve to enrich his land, and at the same time helped to check him in that extravagant use of water, which appears to be fast ruining the country.

There is very little to be said in praise of the general live stock to be seen about the country. Horses are never used in field work, and are practically confined to city vehicles. Occasionally one sees a few fine carriage pairs; but the bulk are very light and weedy.

Donkeys are the pride of Egypt, and are very numerous. I should not be surprised that if a census were taken they were found quite to equal in numbers the native population. Mules are frequently used as draught animals; I was not, however, impressed with either their size or quality. Camels are mainly beasts of burden, and whilst superior to those of Aden, inferior to Tunisian and Algerian camels.

The work of the fields appears to be done almost exclusively by bulls and bullocks and cow buffaloes. The bullocks are ungainly, badly built animals, but in the whole heavier than might have been anticipated. They are very leggy, and might readily be improved upon. Of the buffaloes, curiously enough, none but cows are ever to be seen; they are useful but ungainly beasts, yielding both milk and labor at one and the same time. When young they are enveloped in a long, shaggy coat, which they lose at maturity, when they become practically hairless. In the summer time they cannot be worked, as they take to water to escape from insect tormentors, in which the land, as of old, abounds. Good bullocks appear to be worth £15 to £20.

Sheep for the most part are black and tailed, covered with long hair that is here called wool. There is no doubt that the average Egyptian sheep is a very poor animal, perhaps the poorest sample of its species that I have ever seen; and yet the fellah is unreasonably proud of it. I was endeavoring to ascertain from a native woolspinner why in Egypt preference had been given to black sheep, whilst in most other countries white sheep were preferred, but the only answer I could secure was that Egyptian sheep were the best in the world. These sheep are generally found in small flocks of 5 to 30, guarded by small boys, grazing wherever any scanty herbage was available. They occasionally follow cattle in the "berseem" fields. The coarse wool is wholly reserved for strictly home consumption. From what little I was able to observe, I am

strongly of the opinion that there are at least two distinct breeds of sheep here; I was not able, however, to determine their peculiarities very closely. These sheep appear hardy enough, and, considering the conditions to which they are subjected, must be practically immune to footrot.

Of orchards there exist very few in Egypt, and what there are are very badly kept. They generally contain citrus trees, and, to lesser degree, apricots and peaches. The trees appeared to me everywhere too closely planted, and unhealthy looking.

I have carefully examined Egyptian imports to ascertain whether any of our produce might find an outlet here. I summarise below a few data on this subject.

The population of Egypt is between 11,000,000 and 12,000,000, of which not more than 150,000 are Europeans. The total imports in 1908 were represented by about £25,000,000 sterling, and the total exports by £21,000,000 sterling. The principal lines of imports in 1908 were represented by textiles, about £6,500,000; cereals, vegetables, flour, &c., about £3,750,000; timber and coal about £3,333,000; metals and manufactured metal, about £3,000,000; animals and animal food products, about £1,000,000, &c., &c.

I append below some of the principal imports in which we might be interested, together with their present origin:—

1.—Meat, Salted, Smoked, or Frozen—£111,452.		£
From Great Britain		25,989
British Oriental Possessions		19,981
Italy		16,313
Austria		15,069
France		12,270
Turkey		11,955

“British Oriental Possessions” includes, of course, Australia and New Zealand.

2.—Butter—£112,514.		£
From Turkey		83,524
British Oriental Possessions		17,601
Italy, &c., &c.		5,338

3.—Cheese—£174,273.		£
From Turkey		110,519
Italy		17,874
Switzerland		11,231
British Mediterranean Possessions		11,203
Holland		8,815
France		6,759

4.—*Honey*—£1,273.

Mostly from Crete. I find honey retailing here at 1s. to 1s. 6d. per pound. There should be a good field for our honey amongst a population exceedingly fond of sweet things, to the extent of sucking sugarcane in the streets.

5.—*Condensed or Sterilised Milk*—£20,437. £

From Switzerland	9,191
Great Britain.....	6,936
Germany, &c.	1,394

6.—*Wheat*—£145,509. £

From Turkey	70,440
British Mediterranean Possessions.....	67,249
British Oriental Possessions	6,009
British Oriental Possessions, &c.. &c.....	6,009

7.—*Maize*—£147,188. £

Turkey	106,002
Roumania	20,747
Russia	12,759
Bulgaria	6,967

8.—*Barley*—£148,399. £

From British Mediterranean Possessions.....	79,146
Turkey	42,096
Austria	14,009
Russia	8,355
Roumania	3,668

9.—*Potatoes*—£66,131. £

Italy	52,505
France	8,364
British Mediterranean Possessions, &c.. &c. .	4,165

10.—*Flour*—£1,753,270. £

From France	1,107,235
Great Britain.....	292,045
Russia	124,607
Italy	72,821
Germany	37,559
Roumania	35,475
United States	29,055
Belgium	21,437
Bulgaria	12,983
British Oriental Possessions	12,196
Canada	3,063

	11.— <i>Grapes</i> —£59,737.	£
From Turkey	57,008	
	12.— <i>Bananas</i> —£16,010.	£
From Spain	£15,929	
	13.— <i>Other Fresh Fruit</i> —£195,904.	£
From Turkey	137,335	
Italy	23,759	
British Mediterranean Possessions.....	16,114	
Greece	15,768	
	14.— <i>Dried Fruit</i> —£260,428.	£
From Turkey	173,702	
France	28,957	
British Oriental Possessions	24,451	
British Mediterranean Possessions.....	17,051	
Italy	6,904	
Spain.....	6,498	
	15.— <i>Sugar</i> —£580,530.	£
From Java	112,294	
Russia	414,123	
	16.— <i>Jams and Preserves</i> —£87,413.	£
From Britain	51,946	
France	14,238	
Turkey	9,581	
British Oriental Possessions	2,028	
	17.— <i>Wines</i> .	£
3,372,521galls. in wood, valued at	129,693	
35,794doz. bottles, valued at	36,322	

The principal suppliers of wines are France, Turkey, Italy, and Greece.

18.—*Brandies, Whiskies, &c.*—£140,123.
Mainly from Great Britain, France, and Greece.

I learnt accidentally that superphosphate from Holland, going 16 per cent. to 18 per cent. of phosphoric acid soluble in water and citrate, can be delivered c.i.f. at Alexandria for £2 7s. a ton.

SOME INTERESTING STATISTICS.

BY W. L. SUMMERS.

In connection with the Chamber of Manufactures' Exhibition held during the past month I prepared for the Government court some statistical tables dealing with agricultural production. These tables show in a striking manner the extent to which the prosperity of South Australia as a whole is dependent upon the prosperity of the rural population. Considerable interest has been manifested in these figures, and, in accordance with some suggestions, they are republished in this *Journal* for general information.

TABLE I.—*Cereal Production.*

Year.	Wheat.	Barley.	Oats.	Hay.
	Bushels.	Bushels.	Bushels.	Tons.
1860....	3,576,593	—	52,989	71,241
1875....	10,739,834	197,315	88,383	194,794
1890....	9,399,389	175,583	116,229	310,125
1900....	11,253,148	211,102	366,229	353,662
1904....	12,023,172	346,718	555,696	294,252
1908....	19,397,672	825,740	1,280,235	591,141
1909....	25,000,000 (estimated)			

Total wheat production 1905-1909 (five years)—101,000,000bush.

This table, showing the progress of cereal production, is interesting. Except for 1909 the figures are taken from the official statistics. It will be noted that 1890 shows a lower total for wheat than 1875, due of course to the extremely dry season. Our first official statistics of wheat go back to 1840, when 20,180bush. were reaped; from this on to 1866 progress was fairly steady, with variations due to seasonable conditions. In 1866 we produced 6,651,451bush., but the following year the crop was less than one half. In 1875 the crop reached 10½ million bushels; then for three years there were decreases, but 1879 produced 14,260,964bush. Again three years elapsed without any increase, but the following season the figures went to 14,649,230bush.; another three years of lower figures brings us to 1887, when the crop was estimated to be 19,012,000bush. This figure was not reached again for a period of 18 years, the decrease being due to dry seasons and the consequent falling off in the area under crop in the Upper North, where dairying and sheep-raising have been found more reliable than wheat-growing. Since 1905

the crops have been good, and the total for five years as shown in the table exceeds 101,000,000bush.

In barley the increase, due largely to the demand for malting barley, has been very marked. It is interesting, however, to note that as far back as 1870 we produced 377,792bush. of barley, and that this figure was not exceeded until 1903. In oats, production has also materially increased of late years, a greater quantity being now grown for hay, while the grain is also more largely used for feeding purposes. Hay is always a variable quantity, the return depending more on the probable demand than upon the season, though the development of our inter-State trade in chaff has caused a material increase in the tonnage cut during late years.

The next table shows the values of cereal exports during the past ten years —

TABLE II.—*Total Values Cereal Exports for 10 Years.*

Year.	Wheat and Wheat Products.	Oats.	Barley.	Hay and Chaff.
1899....	783,751	853	678	25,833
1900....	860,538	1,882	1,039	22,402
1901....	1,323,829	4,947	276	75,798
1902....	1,204,940	17,387	5,994	481,404
1903....	1,110,673	19,628	14,849	287,522
1904....	1,623,683	5,039	18,567	78,622
1905....	1,853,428	8,086	10,342	93,922
1906....	2,625,186	16,061	26,795	165,420
1907....	2,778,522	86,758	39,094	261,946
1908....	3,466,683	29,967	69,903	492,890
Total	17,631,233	190,608	187,837	1,985,759
10 Years.				

In this table wheat, bran, flour, and pollard are included in "Wheat and Wheat Products," and compressed fodder in the "Hay and Chaff" totals. The most striking figures in this table are those showing the increase in wheat and wheat products export. The ten-year period just goes back to the last two years the record drought experienced in Australia; prior to that the figures were of much better. It is interesting to note that as far back as 1864 our exports of breadstuffs were valued at £1,464,593. The development in the inter-State demand for malting barley is shown in the rapid increase in the value of our exports, while the effect of the years of deficient pasture in the other States on our exports of hay and chaff, and in a lesser degree of oats, is well illustrated. Last year's figures will show a big falling off in these lines; unfortunately, however, these are not yet available for publication.

Our next set of figures is of special interest, showing, as it does, the great preponderance of exports of agricultural products. As in the previous table, 1900 just takes in the end of the great drought period. As will be seen from this table, agricultural products average about 80 per cent. of the total exports of South Australian products.

TABLE III.—*Export Values.*

Year.	Value of South Australian Pro- ducts Exported.	Value of Agricultural Exports.	Percentage of Agricultural to Total Exports.
	£	£	
1860....	1,576,326	1,123,695	71·28
1875....	4,442,100	3,560,269	80·15
1890....	4,410,062	3,887,957	88·16
1900....	3,610,517	2,746,827	76·08
1904....	5,730,105	4,390,388	76·62
1908....	8,551,351	7,391,358	86·43

Breadstuffs and wool are the chief factors in the high total of agricultural exports. While of late years breadstuffs as a rule exceeds wool in value, this was not the case in earlier years. After agricultural products, minerals are the most important of our exports, the figures varying with the rise and fall in the price of copper. In 1904 minerals, including salt, to the value of £581,576 were exported ; 1905, £628,357 ; 1906, £930,892 ; 1907, £939,367 ; 1908, £514,863.

The final table, showing live stock in South Australia, does not call for much comment. The effect of the drought is, however, again illustrated in the 1900 figures, which show a falling off in ten years of 145,000 cattle and nearly 1,750,000 sheep. In the succeeding eight years, however, this leeway has been practically made up, notwithstanding the development during that period of an extensive export trade in frozen lambs and mutton.

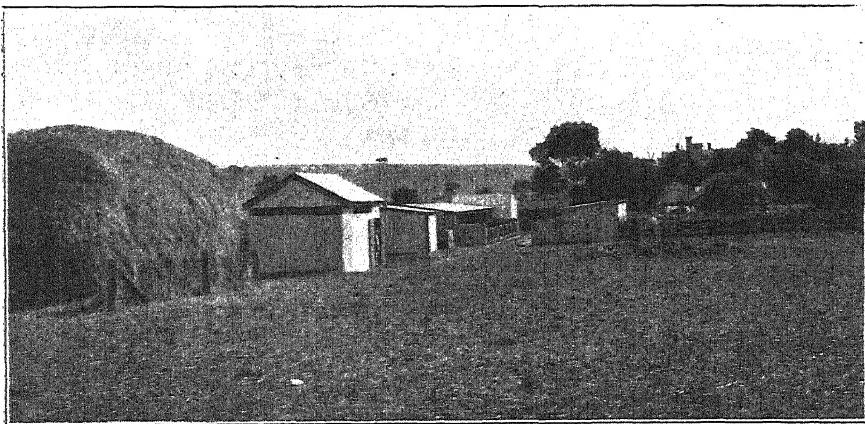
TABLE IV.—*Chief Live Stock Statistics.*

Year.	Horses.	Cattle.	Sheep.	Value Wool Exports.
				£
1860....	49,399	278,265	2,824,811	573,368
1875....	107,164	219,240	6,179,395	1,833,519
1890....	199,605	359,938	7,050,544	1,353,762
1900....	179,352	214,761	5,283,247	1,003,391
1904....	200,241	272,459	5,874,979	1,367,473
1908....	213,385	340,376	6,898,451	1,629,662

PIGGERY AT TURRETFIELD.

By P. H. SUTER, Dairy Expert.

A great deal of the success of the pig-raiser will depend upon the judgment and care exercised in the selection of the site for the pigsties. Drainage, convenience to farm buildings, shelter, &c., must all be taken into consideration. When selecting the site for the pigsties and yards at Turretfield, dryness was the first requisite, and a gentle slope, ensuring good natural drainage, about 120 yds. distant from the milking-sheds and separating-room, was determined upon. The sties are most conveniently situated to allow of economy of labor in feeding, and at the same time are far enough away from the cheese and butter manufacturing rooms, milking-sheds, &c., to avoid any risk of contaminating the atmosphere. The prevailing winds carry any odors from the piggery away from the dairy buildings.



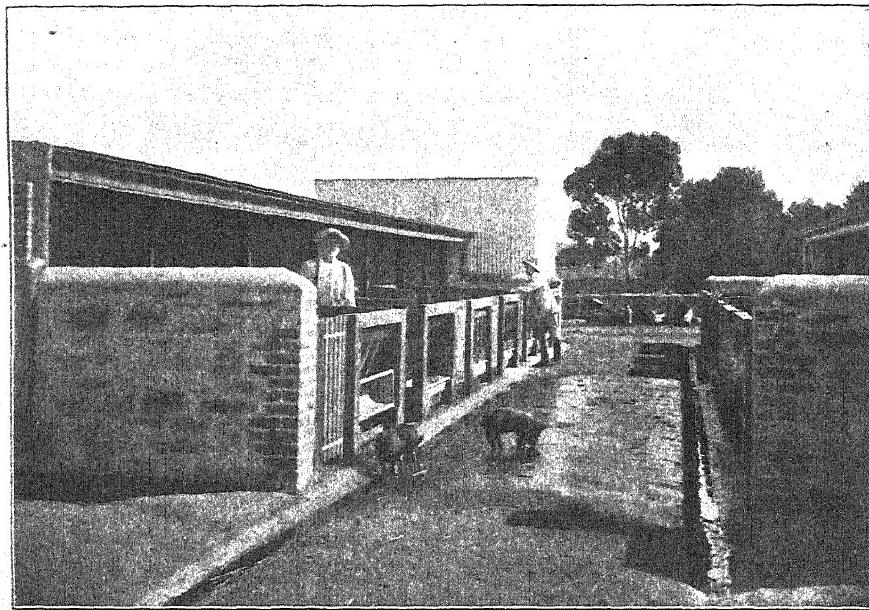
General View of Piggery, showing Straw-stack, Slaughter-house, Smoke-house, Sties, and Yards.

Upon the site selected 12 roomy pens have been erected, so arranged that all the liquid manure from pens and yards finds its way by means of drains on to a block of land on which suitable green feed, such as lucerne, roots, &c., is grown for the pigs. I place special value on the liquid manure from all animals, and would point out the necessity for making every provision to utilise it either by direct drainage or by absorbing it in straw.

The first illustration gives a general view of the piggery. In the foreground is the piggery strawstack, which is used for bedding the pigs; then, in order, the killing-shed for pigs for bacon manufacture, smoke-room, boiler, and pigsties. There is a well-made 10-ft. roadway between each row of pens, with

a drain on each side. At the back of the pens are well-built exercise yards—three at the back of each row. Each yard is 56ft. long by 20ft. wide. At the back of each pen there is a doorway 2ft. 9in. high by 2ft. wide, which opens into an alley 3ft. 6in. wide, with gates leading into each yard. Each yard thus serves two pens, the pigs being let out on alternate days.

Construction of Pigsties.—All pens, roadways, &c., are so constructed to allow of quick and perfect drainage. The floors in six of the pens are of brick on edge, the other six being cement concrete, in each case with a $\frac{2}{3}$ in. fall to the drain on the roadway. The walls of the main building are constructed of stone, with brick facings at the corners. In constructing the floors of the pens special attention was given to providing a ready means of



Front View of Pigsties, showing Trap-doors and Feed-troughs.

cleaning out the manure and supplying fresh bedding. The pen is carefully cleaned out every day, and under such conditions it really means little work and sound sanitary conditions, besides educating your pigs to cleanly habits.

The pens are divided off by partitions made of redgum planks, 6in. by 2in., placed between two sets of two rails. These are movable, but should pigs be inclined to push them up they can be lightly held by a nail or batten. All divisions in pig pens should be constructed to allow of the whole of the partition being readily removed and carefully scrubbed when necessary. Each pen is again divided into two, the back part or sleeping half being roomy and warm, the floor being 3in. higher than the front half or feeding portion. Provision has been made to protect the young pigs by placing a

guard rail around each side of the pen, the material used being 4in. by 3in. redgum rails, secured to posts let into the brick. These rails are 8in. from the walls and partitions, and 10in. high. This rail allows the young ones to get clear and safe away from the sow, as she cannot crush them against the walls, for a sow invariably places her back against the wall when pigging.

The pens are 16ft. deep by 12ft. wide; main outside stone wall at back, 10ft. high; sleeping compartment, 12ft. by 8ft.; feeding compartment, 12ft. by 8ft. The roofing is of galvanized iron, and projects 18in. beyond the sleeping portion of the pens, leaving the feeding portion open to give free access to sunlight—one of our best purifiers. The roof has a slope of $2\frac{1}{2}$ in. The construction of the gateways and troughs in the front of the pens is shown in the second illustration. The troughs are made of 18-gauge galvanized iron, the top edges being turned over, soldered, and riveted around $\frac{3}{4}$ in. gas-piping. At the back edge the piping is allowed to extend 4in. at each end and is let into the two 4in. by 4in. redgum posts, as seen in first pen on the left side of illustration. The troughs are readily cleaned by simply turning right over and emptying into the main drains running directly in front of each sty. Immediately over and running the full length of the trough is a flap door, which is strongly hinged to the top rail. When feeding the pigs this door is simply pushed forward, and the drop bolt will drop at the back of the trough and hold it in its place, as shown in second pen on the left, or the trough may be turned over and cleaned, as shown in No. 1 pen. It will be noted that there is also a piece of 3in. by 2in. under the trough. This is to keep it in its place.

I would also mention that the partition dividing the feeding portion of the pen from the sleeping portion is kept 3in. from the floor, as also the gates and the piece of timber under the troughs is held 2in. from the bricks to ensure perfect drainage.

Feeding-Room.—This is a galvanized structure shown at the end of the pens. Here we keep the crushed barley and other foodstuffs, such as pumpkins and melons.

Water Supply.—The whole of the piggery is well supplied with good fresh water.

A boiler is built in and is used for cooking all food for the pigs, it being situated between the smoke-house and the pens, as shown in the first illustration.

It is intended to make pig-rearing an important part of the work at Turretfield. At present we have 100 pigs, principally pure Berkshires, the parent stock having been selected from New South Wales, Roseworthy College, and the importations made by the trustees of J. H. Angas. Stud pigs are sold, and it is difficult to keep pace with the demand. The champion boar at the Adelaide Royal Show 18 months ago was purchased, and is being mated with some sows of excellent type and pedigree.

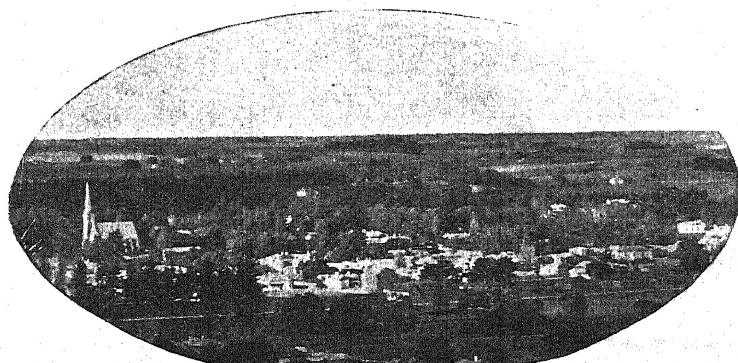
EARTHING UP WHEAT.

In the December issue of the *Journal* of the Board of Agriculture, England, particulars appeared of an alleged new method of growing wheat. The author of this system, M. Demtschinsky, a Russian, claimed that by earthing up the plant, or alternately sowing in gutters or trenches, and gradually filling these in during growth, the tillering power of the plant was largely increased, the plant made more resistant of dry spells, and the returns greatly enhanced. Where the seed is sown in trenches the first earthing up is done when the young plant begins to shoot. About ten or twelve days later the treatment is repeated, and also at further intervals during growth.

Such a system of treatment would necessarily require very heavy yields to pay expenses, and it appears quite impracticable except on a small scale. That there is nothing new in the so-called discovery is shown by the following extract from the January issue of the *Journal of Agriculture* for Cape Colony:—
“In parts of China, where land is scarce and labor cheap, the earthing up of wheat is practised to a considerable extent. The seed is planted in hollows, and from time to time during the growing season is earthed up. The earthing up causes new roots to grow from each knot to which the earthing up is carried, and a number of new shoots are thrown off. Thus a plant which in the ordinary way might have yielded three to five ears can in this way be forced to grow from five to ten times as many. An experiment of this nature was carried out last season by Mr. T. A. Sladdin, Union Castle Buildings, Cape Town. The wheat was planted on white sandy soil on June 15th. In July the seedlings were earthed to a sufficient height to cover the first joint above the root, and were watered for the first and only time. On the 1st of August the seedlings were earthed up a second time, and on the 22nd of August were earthed up for the third and last time. As a check some of the plants were only earthed up twice, and some not at all. None of the plants received any manure, and were grown on the poor soil of the Cape flats. The plants not earthed up yielded an average of three heads; those earthed up twice five heads; and the three earthings up gave a yield of 26 heads. Not alone were the number of heads increased, but the heads from the earthed up plants were far finer.”

It is well known that most cereals will throw out fresh roots from the joints or nodes if these are covered with soil during the growing period, but generally when this occurs the lowest roots appear to lose vitality and the plant depends upon the newly-formed roots nearer the surface. Frequent illustrations of

this may be observed on our beach sandhills, where oats and wheat often grow from the dropping of horses or from waste from the nosebags. I have often dug up plants showing four or more distinct sets of roots caused by successive drifts partially covering the plants. It would, however, be of considerable interest if a test of this system could be made on a small scale in our drier districts. If the seed drill were fitted with small wings on the hoes to prevent the soil falling back, the wheat might be sown 4in. or 5in. deep on sandy soil, leaving a gutter 3in. to 4in. deep. When the wheat was above the surface a light harrowing with reversed harrows would fill the gutter up at least an inch; a further harrowing would probably fill the trench, and if the wheat were sown in drills 12in. to 14in. apart it would be possible to earth it up by means of a cultivator. As a matter of fact, the wind would most probably cause the sandy soil to fill the trenches up without any harrowing, but this would possibly be a drawback, as a few windy days early in the season would easily fill the trenches up too quickly. As previously stated, it is questionable whether the extra crop would pay for the extra outlay, but the experiment would be instructive, as if the plants so treated are more drought-resisting it is possible that a modification of the system could be brought within the sphere of commercial wheat-growing.



A GLIMPSE OF MOUNT GAMBIER

EXPORT OF JAPANESE PLUMS.

BY W. L. SUMMERS.

Some four or five years ago the Agricultural Department exhibited at the March Show samples of Japanese plums which had been kept in cold storage for about six weeks. These fruits were exceedingly attractive in appearance, but apparently, owing to their being too ripe when gathered or being kept at too low a temperature, the flesh right through to the stone was brown and flavorless. The following year the experiment was repeated with somewhat similar results. Two years ago, at the special request of Major Norton (Trade Commissioner), who saw these plums at the Adelaide Show, I packed two cases in single-layer trays, which went forward in the ship's store in the s.s. *Waratah*, and three cases for the s.s. *Ormuz*. Three different varieties of plums were forwarded, viz., Burbank, Climax, and Wickson. The former were a complete failure in this respect, repeating our experience with them here in cold store; the other two varieties carried well, and realised profitable prices, though some were too ripe when packed.

This year, at my request, Mr. G. R. Laffer, of Belair, packed three cases of Climax plums for shipment in the s.s. *Ormuz*, which left Adelaide on January 13th, and four cases of Wickson for shipment by the s.s. *Orvieto* on January 27th. The former, through the courtesy of the manager of the Orient S.S. Coy., were carried in the ship's chamber, and the fruit arrived over-ripe. This was probably caused by variations in the temperature of the chamber due to frequent opening for removal of stores. Those plums which were in fit condition for sale realised 13s. 6d. per case. The Wicksons were carried in the pear chamber, engaged by the S.A. Fruitgrowers' Association for the experimental shipment of Duchess (Williams) pears, and arrived in splendid condition. They realised £1 per case of three trays, while the total expenses amounted to as nearly as possible 5s. 9d. per case. These results are certainly satisfactory, and it is evident that not only will the fruit carry to England, but that there is a market for a limited quantity at a profitable price. Prices of 20s. to 25s. per case are fancy figures, and we could not expect to get anything like that if we sent several hundred cases at a time.

There is, however, a serious difficulty in developing any business with these plums, and that is the question of space in cool chambers. Through the courtesy of the shipping companies we have been able to send small trial lots in ship's store, but this cannot of course be done commercially. As the smallest cool chambers on the mail boats have a capacity of 350 cases—and this only in two or three boats—it will be necessary to fit in with some other fruit if a market is to be opened. For the early-maturing plums there does

not seem any chance of doing this, but the later varieties would be ready at the same time as Duchess pears and the earliest apples. All that can be said at present is that the prospect of securing an outlet for a small quantity of this fruit is promising.

In this connection the following extracts from the latest report of the Trades Commissioner in London for Cape Colony are of interest :—“*Japanese Plums.*—The total shipment of plums for the past season amounted to 32,184, as against 15,047 for the previous year. This large increase was not too much for the market to take. The favorite varieties were much sought after, and made good prices. The markets are widening, and the demand is increasing for this fruit. Apple Plums, 7s. to 10s.; Satsumas, 6s. to 8s.; Kelseys, 5s. to 7s.; Chalcots, 4s. 6d. to 5s. 6d.; Wicksons, 3s. 3d. to 4s. 6d.; Burbanks, 2s. to 3s. These prices were for sound and fairly sound fruit. It is impossible to record the prices of wasty and over-ripe fruit. It will be seen from the above figures that the two dark flesh varieties—Apple Plums and Satsumas—are easily first; they are much liked both for their flavor and attractive appearance; but it must be borne in mind that the quantities of shipments of these varieties were very small compared with others. If large shipments of these were to come forward, the prices would fall to some extent. I am glad, however, to record that quantities of the Satsuma shipments have increased. The next favorite are the Kelsey; they are always a good plum for this market; they travel well, have a bright and attractive color, and are of good size and flavor. Wicksons are also fairly attractive in color, and are of good size, but of very poor flavor, besides which they usually arrive out of condition—either too green, or else over-ripe. When sound they are deceptive to the consumers. Whenever I hear anybody complaining about having bought Cape plums and found them to be of unpleasant flavor, I know they have had Wicksons. As to Burbanks I can only repeat what has frequently been said by myself and by the agents of the growers on this side, viz., that they are not suitable for this market. They are not liked, and, moreover, spoil the good name of Cape plums, besides which they frequently arrive in a bad condition. I feel sure that the shipments of the past season did not pay for the freight and packing. The packing of plums is more simple than that of other fruit; they should be tightly packed with as little wood wool as possible, wrapped in fancy paper, well graded, and in counts from 24 to 36. Three boxes should be battened together.”

The capacity of these plum cases is not made clear in this report; those sent from South Australia would contain 15doz. to 18doz. plums. Of the varieties mentioned as being most in favor in London, Apple and Chalcot are scarcely grown in South Australia, while Satsuma and Kelsey are not very popular.

WINTERING BEES.

By "NEMO."

One of the fundamental points connected with profitable bee-keeping is to successfully winter the bees. By taking every precaution in the autumn, when the honey flow is waning, to see that his colonies are fully prepared to pass the winter secure from misfortune the beekeeper is laying the primary base for prosperity during the following season. That the climate of South Australia is not so cold as that of some other countries is a point that must be carefully considered.

Bees in colder atmospheres remain dormant in a small cluster in the combs for long periods during winter, and the wear and tear of life and tissue is exceedingly small, while they are able to recommence their work in the spring with their vitality nearly unimpaired. Bees wintered in a warmer climate are more or less in a state of semi-activity, and when spring commences they are often partly worn out, and die off rapidly, causing what is known as spring dwindling.

Winter fatalities arise from one or other or a combination of four causes—(1) paucity of bees, (2) insufficient protection, (3) food question, (4) ventilation.

Paucity of Bees.—In the height of a season's work the worker bee only lives from six to eight weeks, and under some circumstances even less. The bees that hatch after the honey-flow has gone live longer, as their duties are less arduous. They live through the quiescent period of winter to recommence the work of the colony in the early spring. Therefore, before packing bees down for winter care should be taken to see that the queen has had every encouragement to lay, so that young bees are hatching in large quantities to strengthen the colony for winter, thus ensuring strength in the following spring. The adage runs as follows—"Bees are the best winter protection for bees." When the external temperature falls very low, the bees gradually form a dense cluster, and by alternately protruding and contracting their abdomens breathe rapidly, inspiration and expiration proceeding through spiracles (breathing tubes) situated on either side of the body, fourteen in number. Honey is passed from the honey-sac to the chyle stomach, whence it enters the fluids of the bee, and, coming in contact with the oxygen of the air, the oxidation evolves heat to sustain the cluster. The consumption of honey creates practically no excrementitious matter, but pollen is used to replenish the muscular power and nerve energy, and its residue is held in the bowel until a flight on a fine day enables them to discharge it. Should confinement prevent this flight, the bowel often becomes overloaded if an excess of pollen is consumed, and a dysenteric condition occurs with discharge over

the combs. By preserving the perfect rest (the hibernating state) very little wear and tear is created, and consequently the amount of pollen consumed is comparatively small and the bowel does not become unduly distended.

Protection.—The hives for successful management should always be sheltered from high winds. Bees flying in the autumn, winter, and spring are liable to be blown to the ground, getting chilled and unable to reach the shelter of their hives again. When packing hives down for winter place above the brood frames two end bars, laid across the frames, about 3in. apart; the cloths are then packed over these to preserve a space over the frames, so that the cluster can move readily from comb to comb. The cloths should completely cover the frames, and be of a porous nature, so that slow upward ventilation is permitted, with no draught. When spring draws near and brood-raising commences in good earnest, the addition of extra cloths assists the bees to preserve the necessary heat, and extend the brood-nest, with no danger of chilling the young larvae. Dampness is one of the greatest evils bees have to contend with, and all hive roofs should be perfectly watertight.

Food Question.—This is a somewhat debatable question amongst beekeepers throughout the Commonwealth, especially with regard to the pollen theory. Honey enables the bee to produce heat and energy, and pollen renews their nerve tissue and muscle. Many beekeepers consider that certain honeys and pollens are harmful to winter on, and this is a question that must be carefully considered by the beekeeper when packing for winter. For an instance, scrub gum honey is considered by many to possess inferior wintering qualities. It is usually gathered quite late, and consequently the bees often have to winter on honey gathered so late in the season that they were unable to raise the required temperature to evaporate it to a ripe consistency, and every beekeeper is aware of the danger of wintering on unripe honey. Most honeys properly ripened are not to be feared, but in an unripe state will cause disaster. The pollen question is one that must be studied carefully as one open for further scientific investigation. It must be remembered that it is not always the actual composition of pollen that causes bowel distension, but the abnormal consumption of it under adverse wintering conditions, as has already been pointed out. The remedy in the majority of cases lies in securing the very best wintering conditions.

Ventilation.—Slow, upward ventilation without draught should be preserved. The method of oxidising honey with the carbonic gas and moisture that is thrown off during the process renders a supply of fresh air a necessity, and an entrance 5in. or 6in. should be maintained. Roofs having ventilation holes covered with perforated zinc provide circulation of air in the roof, which reduces the heat in the summer and prevents damp in the winter.

In conclusion, emphasis is again laid on the fact that it depends largely on the care taken in preparing for winter whether the beekeeper will have a prosperous season.

EGG-LAYING COMPETITION, 1909-10.

By D. F. LAURIE, Poultry Expert and Lecturer.

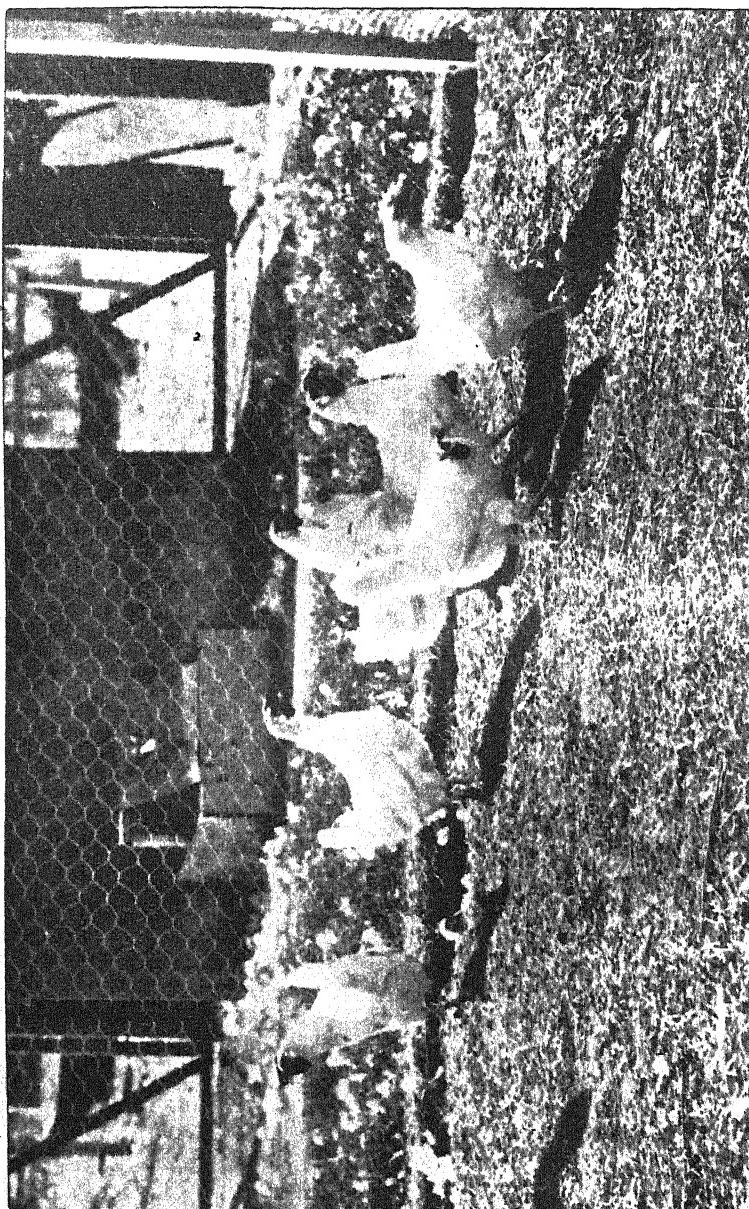
In the 1909-10 egg-laying competition, held under my supervision at the Government Poultry Station, Agricultural College, Roseworthy, the total number of entries were 113 pens, of six birds each, which constitutes a world's record for any one competition. In the 1907-8 competition the local egg-laying record was established, and it is worthy of note that the previous world's record was established at Subiaco, in Western Australia, by a pen of birds owned and bred in South Australia. Again in 1907-8, at Gatton competition, the world's record, which still stands, 1,538 eggs, was gained by another pen of South Australian bred birds. This year, although the much-hoped for new record has not been made, it is gratifying to note that the leading pen of White Leghorns has laid 1,531 eggs, which is a better performance than the 1,531 eggs laid by the winning pen in the 1907-8 competition, as that year was a leap year of 366 days. This additional record shows that careful breeding and selection can give hens averaging over 250 eggs per hen per annum. This has been proved on four occasions by South Australian breeders. I confidently look for a considerable increase in the number of hens of this quality in the future. The oft-repeated contention that high-laying and satisfactory conditions can only be obtained from a few specially-selected birds is absolutely discounted by this year's figures. Practically as good results have been obtained this year from twice as many birds as there were in the last year's test. The season has not been propitious, and I do not hesitate to say that included in the test were a number of birds that no experienced breeder would expect large numbers of eggs from; these causes contributed to lower results.

Without entering into the disputed question of the relative values of competitions conducted by the State as against those under private supervision, I content myself with noting the popularity throughout Australia of our State-directed competitions, and also the great advertisement gained by widely publishing the results in various parts of the world. To the press, in all branches, thanks are due for the publication of the weekly and monthly totals. These are eagerly looked for, not only by the competitors actually concerned, but by their friends, all breeders, and a very large section of the public. The publication of our excellent records, and the numerous comments in the English press are attracting general attention to the potentialities of poultry-breeding. Although practically every writer on poultry for the last 50 years has accentuated the fact that laying is chiefly a matter of strain and caref

breeding, there can be no doubt the results of the laying competitions have brought the matter before breeders and the public in a convincing manner. Further, the names of competitors make a list of breeders whose stock is more or less judged by results. This forms a guide to purchasers of eggs and stock. The wise breeder enters his stock for this reason, among others.

As regards egg production, the results show the undoubted superiority of White Leghorns. Among the other light breeds only a few of birds, Brown Leghorns, have shown themselves capable of passing the 200 average. It remains for breeders of light breeds other than White Leghorns to look to their laurels. The South Australian laying strain of White Leghorns are splendid egg-producing machines, but they are not all-round birds. Those who are breeding and selecting their Orpingtons and other heavy breeds to compete as layers with White Leghorns are ill advised. Our splendid modern Orpingtons and Wyandottes are all-round utility birds. If egg production alone is bred for, the table qualities must suffer. This can be seen in many of the pens in the competition. In future, to encourage breeders of this class of birds, there will be heavy-breed sections, with perhaps certain special conditions.

It has been stated that one of the results of breeding for high egg production must inevitably be sterility. As a rule these statements are made with the mistaken notion that South Australian breeders, at any rate, feed for egg production on forcing foods. This idea, as regards the laying competition, will, on reference to the remarks on feeding, be dispelled. The majority of our breeders here follow very closely the competition feed as carried out at the Roseworthy Poultry Station. Over-stimulation of the organs of reproduction, if due to irritants, would undoubtedly have a prejudicial effect; but the judicious feeding to a hen of high-laying potentialities sufficient food containing the constituents necessary for the production of large numbers of eggs can have little serious effect. It has been stated that the laying of large quantities of eggs causes abnormal conditions in the oviduct, but I know of champion layers now in their fourth year laying eggs which are not only normal, but distinguished by extra strong shells, and, as a rule, the percentage of fertility is high. To come nearer the truth is to acknowledge the principles of heredity. There are, I am sure, scores of fowls suffering from hereditary taints or predispositions due to many causes which originated generations ago. No amount of care, short of forced cessation of egg production, will make a hen with oviduct troubles lay normal shelled eggs. Cystic ovarian disease, of which we have heard so much of late, is distinctly hereditary in its character, and I have reason to believe conforms to Mendel's law in the matter of its frequency and distribution. Another point that must not be lost sight of is that all breeders are more observant in minute details than was the case a few years ago. It is the observant breeder who will, however, do the best and most lasting work in selection.



First Prize White Leghorns—Mr. C. B. Bertelsmeier, Clare.—Record, 1,531 Eggs.



First Prize Black Orpingtons—Carolina Egg Farm, Fullarton.—Record, 1,190 Eggs.

Breeders of White Leghorns have been concerned at the somewhat frequent cases among some strains of broodiness—the more or less partial exhibition of the maternal instinct. It is well known that a few years ago, owing to the unnatural craze for a certain exaggerated type among exhibition White Leghorns in England, recourse was had to an infusion of Malay blood to give the required structural alterations. As far as Australia is concerned—that is as regards her laying strains of White Leghorns—there has never been an infusion of this particular English type, and it may be definitely stated that the broodiness referred to is not so to be accounted for. Neither is it due to impurity of blood. My opinion is that the reappearance of broodiness, which may have been in White Leghorns a latent factor for generations, is to be clearly accounted for by the application of Mendel's law of segregation. I believe the instinct can be eradicated or developed by systematic scientific breeding.

Reference is made in the report of the Superintendent of Roseworthy Poultry Station to two food items. The first is lucerne hay chaff. For many years I have been a strong advocate of the use of this magnificent fodder as the best and most economical for poultry. I have used it practically all my life for fowls. As a green food, chaffed, and either mixed with the mash or fed at midday, or hung in bunches for the birds to pick at, it has a food value superior to clover. I prefer to chaff it, as there is practically no loss. Lucerne hay properly cured so as to conserve the leaf, which contains the actual food, and well chaffed, is a splendid poultry food. It contains about 17 per cent. of flesh-formers, which are also egg-makers. Before use it should be soaked in hot water for some hours. Soak over night for the morning mash. This softens the fibres and renders the chaff more palatable and digestible. There are many other foods agreeable to poultry, such as kale, rape, and other of the brassica tribe, but they contain only half the food value of green lucerne.

The poultry meat meal is similar to the article known in America as beef scraps, and in England as crissel, &c. The sample used during recent years at the poultry stations is manufactured at the Government Freezing Works, Port Adelaide, and is in my opinion superior in every way to any other that I have used. This method of providing animal food is exceedingly appropriate in a climate such as prevails here during the warm months. In hot weather the use of uncooked meat is unadvisable, and it is exceedingly difficult to keep it fresh. Green bone, so much admired by some people, is even more unreliable. During my long experience I have traced many poultry yard disasters to the use of tainted meat or green bone. Preparations similar to the above poultry meat meal are reliable, and can be made into soup by adding sufficient boiling water, and allowing the mixture to stand. According to analysis we can feed in the form of grain and vegetables all the albuminoids necessary for poultry, but the fact remains that these do not perform the

precise functions of the animal albuminoids. Those who say animal food is not necessary must lack experience, observation, and education. The majority of South Australian breeders find that without a due proportion of animal food their egg yield cannot be maintained.

As there is a properly equipped meteorological station at the Roseworthy College, I instructed the Superintendent of the Poultry Station to obtain the information necessary to enable him to give the main weather features in his report. Although Roseworthy is only 30 miles north of Adelaide, the weather conditions often differ to a considerable degree. The position of the pens is exposed and wind swept, and although the yards are somewhat protected by the use of matting, still the conditions are more severe than in most breeders' yards. The weather reports will indicate to breeders that at times the conditions were such that only good layers of strong constitution could do as well as those in the competition. The particulars also serve to show others with similar unprotected land what can be done in the way of artificial shelter.

SUMMARY OF RESULTS.

Number of pens	113
" birds	678
Total number of eggs laid	126,133
" value of eggs laid	£470 12s. 5-75d.
" cost of feeding	£187 0s. 8½d.
Profit over feeding	£283 11s. 9-25d.
Average market price of eggs	11-54d.
" number of eggs laid per pen	1,116-18
" " " hen	186-03
" cost per pen in competition	£1 13s. 1-14d.
" hen	£0 5s. 6-19d.
Profit per pen over cost of feeding	£2 10s. 2-3d.
" hen	£0 8s. 4-2d.
Eggs laid by winning pen, Section I.	1,531
" II.	1,190

MONTHLY PRIZES.

SECTION I.

Month.	Value. s. d.	No. of Eggs Laid.	No. of Pen.	Breed.	Owner.
1909.					
April	14 2-80	119	26	White Leghorn	Sargentri Poultry Yards
May	16 4-92	142	51	"	A. J. Cosh
June	13 7-60	120	40	"	A. H. Padman
July	10 4-43	130	41	"	C. B. Bertelsmeier
August	9 0-08	138	51	"	A. J. Cosh
September	8 11-10	153	17	"	C. B. Bertelsmeier
October	9 5-70	160	17	"	"
November	8 1-98	152	40	"	A. H. Padman
December	8 6-02	153	17	"	C. B. Bertelsmeier
1910.					
January	8 7-61	150	17	"	"
February	8 11-48	115	17	"	"
March	10 11-02	108	17	—	—

SECTION II.

Month.	Value.	No. of Eggs Laid.	No. of Pen.	Breed.	Owner.
1909.	s. d.				
April	16 2·78	135	100	Buff Orpington	J. W. Ross & Sons
May	15 4·64	131	97	Black Orpington	Carolina Egg Farm
June	14 5·88	128	97	"	"
July	9 3·24	114	96	"	"
August	8 3·45	127	108	Silver Wyandotte	A. H. Padman
September	8 6·90	147	68	S.C. Brown Leghorn	G. E. Brown
October	9 0·89	153	68	"	"
November	7 8·84	144	68	"	"
December	8 2·02	147	68	"	"
1910.					
January.....	8 0·92	140	68	"	"
February	8 8·99	112	68	"	"
March	10 8·50	106	68	—	—

The following table shows the returns from the six highest pens in each section :—

No. 1 (WHITE LECHORNS).

Name.	No. of Eggs Laid.	Value of Eggs Laid.
		£ s. d.
C. B. Bertelsmeier	1,531	5 17 1·78
A. J. Cosh	1,367	5 6 4·08
Sargentri Poultry Yards	1,333	5 6 2·74
E. A. Pedder	1,363	5 5 5·61
F. E. Hannaford	1,334	5 4 3·92
S. Craig	1,380	5 4 2·11

No. 2 (ALL OTHER BREEDS).

Name.	Breed.	No. of Eggs Laid.	Value of Eggs Laid.
			£ s. d.
Carolina Egg Farm	Black Orpington	1,190	4 17 7·31
"	" "	1,204	4 16 9·63
W. C. Wurm	" "	1,230	4 15 1·28
B. P. Martin	" "	1,210	4 14 9·91
Kappler Bros.	Silver Wyandotte	1,173	4 12 8·42
W. Provis	" "	1,147	4 11 4·81

BREEDS AND AVERAGES.

The following table will show the positions of the various breeds at the end of the test, also the average of each breed competing :—

Number of Pens.	Number of Birds.	Breeds.	Totals	Average per Pen.	Average per Hen.
65	390	White Leghorn	77,523	1,192.67	198.7
19	114	Black Orpington	20,045	1,055.2	175.8
4	24	Buff Orpington	3,940	985.2	164.2
2	12	White Orpington	1,582	791	131.8
5	30	Silver Wyandotte	5,500	1,100	183.2
4	24	White Wyandotte	3,777	944.25	157.3
3	18	S.C. Brown Leghorn	3,012	1,004	167.3
2	12	R.C. Brown Leghorn	1,987	993.5	165.5
2	12	Minorcas	1,915	957.5	159.5
2	12	Lang-shan	2,106	1,053	175.5
1	6	Black Leghorn	964	964	160.6
1	6	Buff Leghorn	738	738	123
1	6	Ancona	1,000	1,000	166.6
1	6	Andalusian	961	961	160.1
1	6	Plymouth Rock	1,069	1,069	178.1

I have had the following report prepared, in which are embodied various tables and general details of management :—

The Government Poultry Station

At Roseworthy Agricultural College,

March 31st, 1910.

Sir—I have the honor to submit my report in connection with the egg-laying competition for the year ending March 31st, 1910. The present is the sixth held in the State, and the fifth held under Government supervision at Roseworthy.

The improvement noticed in connection with the previous test, when the average of 1,139 per pen was obtained, has been maintained, as the general average obtained this year will show. Although not quite so high as last year, it will compare favorably owing to the increased number of pens, viz., from 56 to 113. In the last test the number of pens was equally divided between the two sections; on this occasion we have the greater number in the No. I., or White Leghorn, section, where this breed is represented by 65 pens. Last year the average per hen obtained by the White Leghorns was 205, and for the heavier breeds 174, a general average of 1,139.6 per pen, and 190 per hen, as against a pen average of 1,079.4 and per hen average of 179.5 obtained during the previous test, which also gave us the South Australian record of 1,531. This year the results show the average of 1,116 per pen, and 186 per hen, which is slightly lower than that for the last test, but can be looked upon as satisfactory, as with such an increase in numbers of birds competing the averages are sure to suffer to some extent. In addition the most unusual weather conditions which prevailed during a part of the

period will be sufficient reason for the shortage noted. The test was duly started on April 1st, 1909, with the record number of entries, viz., 113, made up as follows:—Section I., 65 pens White Leghorns; section II., 19 pens Black Orpingtons, 4 Buff Orpingtons, 2 White Orpingtons, 5 Silver Wyandottes, 4 White Wyandottes, 3 S.C. Brown Leghorns, 2 R.C. Brown Leghorns, 2 Minorca, 2 Langshan, 1 Black Leghorn, 1 Buff Leghorn, 1 Ancona, 1 Andalusian, and 1 Plymouth Rock—48, 65—113, a grand total of 678 birds. As might be expected, this number includes birds in various stages of development, from almost chickens to hens. The recognised breeders generally succeed in getting their birds well on the mark for competition purposes; but, as a rule, there are a number of triers who make the mistake of having their birds too forward or too late, which can be brought about by any of the following reasons—early or late hatching, insufficient numbers to select from, loss of stock through unforeseen circumstances, or poor development of pullets through lack of necessary attention. It has become quite a common expression of late among a large number of competitors and others that they have a nice lot of pullets, but they have been laying for some time and are too early for competition work. This, of course, is a trouble that all have to contend with unless great care is exercised, such as paying closer attention to time of hatching and method of feeding the young stock. This is a most important point for consideration when preparing stock for a competition, as it is recognised by most breeders that some pullets will develop quicker and lay earlier than others, even of the same breed. This point needs careful watching, as there is no doubt that it is entirely a question of strain, and the man who is fortunate enough to possess that strain in sufficient numbers to enable him to select six for work has an undoubted advantage over the less fortunate. While a number of competitors have to start with birds which have been laying some time, some have to start with birds not likely to lay for weeks; the former lose credit for the eggs not laid in a competition, while the latter lose time which cannot be wholly made up, or to the extent that might be expected. It is a common experience that all the birds ease off in their laying at about the same time, viz., from the middle of February to the end of March, when the majority are in heavy moult and the few stragglers do not lay to any profitable extent. They do little more than merely marking time during the last few weeks. In this connection I would respectfully draw your attention to a suggestion to alter the date of starting competitions in this State from the 1st April to the 1st of March. I fully realise this question is likely to open up a lot of new ground, but in view of the ability of breeders to raise pullets which are too early for April, and from carefully watched results, such as end of season laying and moulting condition of the birds, I think the alteration would be worthy of a trial. The birds arrived in good condition, taken on the whole, section I. especially so, considering the numbers and distances which some of them

had to come. They were clean and generally free from vermin, only some four or five pens being affected. In a few instances the birds were backward; the majority looked well, some nice size, and in most cases showed better handling, as they were mostly of a quiet nature. A few pens appeared to be unaccustomed to housing, and preferred to roost anywhere but on the perch which was erected in the house for that purpose. Others appeared total strangers to a feed of mash in the mornings. These may appear to be minor details, but are worth consideration by competitors, as they cannot do too much in training their birds to competition conditions if they desire good results. Section II. contained some good specimens; the majority were in good condition. Some, however, were very young, especially among the Black Orpingtons, one pen being in the chicken stage, and therefore lost three months in the laying period. On the whole this section was a good lot, containing some nice birds in each breed. The Anconas and some Brown Leghorns were very wild, and the Buff Leghorns were noted for their shyness. Considering the journeys some of the birds had to make, and the knocking about they are bound to receive during train and road travelling before arrival, I must say the consignment showed very careful handling and packing by the authorities, as only one bird dead or injured was recorded upon arrival. The new pens were ready to receive the birds, and litter was placed therein during the first few days. Matting was erected to serve as windbreaks, and the birds, especially the heavy breeds, soon made themselves comfortable and at home. The weather remained fine and dry during the period required for dispatching the birds from the previous test and installing the new arrivals. The first two days remained quiet enough to let the birds have a look around and get a start, but the next day a wind from the north-west, accompanied by a dust storm, blew strong enough to destroy a lot of the matting around the yards. The next day cold wind with showers tended altogether to give a bad week for a start. This bad start was followed by adverse weather right through the month. Although the first half contained some dry days, the weather conditions were not conducive to good laying, as we had gales on five days, strong winds on eight days, 13 days of wind, 1·91 points of rain between the 19th and 30th. The latter half of the month was unsettled with cold winds and showers, with dull, cloudy conditions, and the month was officially noted as a record cold April. May opened with dull, cloudy conditions up to the 3rd; 4th, nice warm day; then, until 7th, dull, cold, and showery; 11th, fine; 12th, terrible wind all day; 13th and 14th, fine but cold; 15th to 18th, rains and cold winds; then on to the end of the month changeable, fine and warm, to cold and cloudy. June generally cold with light showers; 8th to 11th, frosts; 12th to 14th, dull, cold, and windy, with light rains; 15th, clear and fine; 16th, dull and cloudy, with cold, north-east winds; 17th, dull, with mild rain; 18th, showery and dull with severe thunderstorm in the

evening; 19th and 20th, dull to fine; 21st, dull and cold, with showers; generally dull and cold to the end of the month. July 1st to 9th, generally cold and clear, with frosts; 10th to 14th, dull and cold, with hail and rain; 15th, fine, with very cold winds; 16th to 29th, generally dull and cold, with heavy rain during the evening of later date, followed by snow; 30th, frosty, clear and fine; 31st, rain, dull, and cold. August 1st, heavy rain with strong wind; 2nd, nice and fine, but cold showers in the evening; 3rd, dull and cold; 4th and 5th, fine and cold; and bright and fine, but cold, throughout until the end of the month. The foregoing is reported to indicate the most unsettled and erratic weather conditions which prevailed during the early part of the year. The following table will show the average minimum, maximum, and mean temperatures, with rainfall and monthly scores by the birds:—

Month.	Temperature.			Rain.	Fr.sts.	Monthly Scores.	
	Average Minimum.	Average Max. mnum.	Average Mean.			Section I.	Section II.
April	43.85	67.19	55.52	1.91	—	4.024	2.096
May	45.96	65.23	55.59	2.89	—	5.938	3.361
June	41.63	59.33	50.48	1.84	4 days	5.246	3.453
July	39.59	56.95	48.27	3.80	5 days	5.538	3.741
August	42.10	59.33	50.74	4.56	3 days	7.167	4.907
September	40.79	64.25	52.52	1.52	—	8.501	5.674
October	47.68	74.19	60.93	2.55	—	8.820	5.606
November	50.36	78.16	64.26	2.08	—	8.107	5.010
December	51.15	80.71	68.93	.70	—	7.839	4.793
January	59.86	91.49	75.67	1.72	—	6.757	4.083
February	56.95	91.31	74.13	Nil	—	5.385	3.135
March *	—	—	—	—	—	—	—

* Records not available.

Broodiness.—The number of broodies recorded from section I. was 206 from 51 pens, thus leaving only 14 pens not affected by broodiness. The number of entries from the pens average from one to 12. Section II., 636 broodies recorded, number of pens affected 45, averaging from one to 49 entries. This is much below the number recorded last year from 28 pens. Although this is a desirable change to note in connection with the heavy breeds, any increase in number of eggs laid, which we would be justified in expecting to follow such a change, has not taken place, which may be due to poorer laying strains. At the end of July last, or the fourth month of the test, I carried out the instruction received to weigh an average dozen eggs from each pen, with the following results:—Section I.—65 pens; weight per dozen, from 21½ozs. to 28ozs.; average, 24.46 per dozen; leading pen, 25ozs.; top weight in section I., 28ozs.; laid by pen 38, owned by R. J. Legoe. Section II.—48 pens; weight per dozen, from 21ozs. to 28½ozs.; average, 24.16 per dozen; leading pen, 25ozs.; top weight in section, 28½ozs., laid by pen 75, owner Mrs. Ladyman.

Smith. A comparison with the previous two years is as follows :—Section I.—1907-8, 25.23ozs.; 1908-9, 25.61ozs.; 1909-10, 24.46ozs. Section II.—1907-8, 24.33ozs.; 1908-9, 24.69ozs.; 1909-10, 24.16ozs., thus showing that the improvement noted last year has not been maintained; also that the average is as low as it is safe to go in view of the increased weight limit imposed in connection with the forthcoming tests, viz., 24ozs. per dozen.

Feeding.—In view of the fact that the feeding of the birds has been conducted much along the same lines as that adopted in previous tests, and of which particulars have been published so often, perhaps it is not necessary to again go into details. The birds were fed at 7 a.m. with hot bran and pollard mash during the months April to September, inclusive; cold mash was used for the remainder of the year, with steamed lucerne chaff at the rate of one-third of the bulk quantity. This was from the beginning of November to the end of the test. The chaff and bran was soaked over night to be ready for the morning. The general average feed was 4½ozs. per bird. Mid-day meal, average about 2ozs. per bird of green food (chaffed), such as lucerne, cabbage, thistles, silver beet, or any other good green food available. Evening meal, grain, wheat, maize, and peas, the latter being used during the colder periods. Average grain feeding about 2ozs. per bird. The most noticeable alteration in the feeding as against other years has been an increase in the meat meal supply at different periods, the soaking of the bran referred to, and the additional quantity of lucerne chaff used, as this has been given in addition to the usual quantity of green feed at mid-day. These slight alterations were undertaken with a desire to note firstly, any rise or fall in the production of eggs; secondly, to note any difference in the number of broodies which might occur through change in connection with the moult. Critics have pointed out in the past various reasons affecting each of the above matters which have made them of interest to me, and I propose to deal with each briefly. Firstly, there has not been any distinctive rise or fall in the production of the eggs, which, given the same number of pens to work on, would have been about on a level with the average obtained last year, but if any difference could be recorded accurately, I think it is in favor of the present test. Secondly, the same proportion of pollard has been used, with the extra green feed and meat meal, and shows a much lower percentage of broodies. This, I think, will help to dispel the notion that the quantity of pollard used was responsible for the pronounced broody instinct of last year. Thirdly, the lowest percentage on record of replacements through death or sickness, and the very healthy manner in which the birds have either gone, or are going, through their moult, which has been a quick and strong process all through so far, will help to show the use of the extra meat has had a beneficial effect. I think a still greater quantity of green feed may be used, especially during the warmer weather, without any ill effects upon the birds; and while the soaked bran may not be responsible for any increase in the supply of eggs,

it certainly must have a less irritating effect upon the birds, and be much more easily digested, and its value as a food made available to a greater extent. The cost of feed and the quantities used will be found as under—678 birds for 12 months :—

	£ s. d.
Wheat—446bush., from 3s. 5½d. to 4s. 11d. per bush.....	97 6 8½
Pollard—790bush., at 1s. per bush, average	39 10 0
Meat meal—25cwt., at 18s. per cwt.	22 10 0
Bran—276bush., at 1s. average for year	13 16 0
Grit	2 10 0
Maize and peas	9 0 0
Lucerne chaff—8ewts., at 6s. per cwt.	2 8 0
Total	<u>£187 0 8½</u>

The above expenditure shows the cost for the year to be 5s. 6·2d. per bird, with a reduction of 3·83d. per bird on the cost of last year. The cost of each of the tests to date is as follows :—

	s. d.
First test	7 9 per bird per year
Second "	3 1 "
Third "	4 11 "
Fourth "	5 4½ "
Fifth "	5 9·85 "
Sixth "	5 6·2 "

The following average quantities of each variety of feed were consumed by each bird during the year :—Wheat, 39·46lbs.; pollard, 23·30lbs.; bran, 8·14lbs.; meat meal, 4·12lbs.; chaffed lucerne, 1·32lbs. during five months; grit, maize, and peas. The cost per bird per week, 1·26d.

The above details in connection with the 1909-10 egg-laying competition include the following satisfactory features in connection with the year's work :—The fair general average obtained in egg production, reduction in expenditure, lower percentage of deaths and sickness, smaller percentage of broodies, and the general good health of all the birds at time of leaving.

I have, &c.,

W. R. DAY, Poultry Superintendent.

FEEDING AND REARING CHICKENS.

By A. H. PADMAN.

This is a subject that is dealt with so frequently by poultry writers that I offer my experiences with some diffidence. There are probably those present who have raised many more chickens than I have, and who have handled many breeds. My hatching records show approximately 4,000 chicks raised, and spread over 10 years. I may say that almost all were with incubators, and virtually confined to White Leghorns. I am much in favor of machine-

hatching. The ease in handling, opportunities for close observation, tameness of chicks—lasting through life—freedom from lice, scaly leg, and contagious diseases outweigh everything in favor of the machine. In up-to-date yards I reckon "Biddy" is a thing of the past, except for odd clutches out of the main hatching season. I therefore propose to confine myself to the incubator-hatched stock and the producing of layers. In my opinion, next to strain the care in feeding and attention given in the first few months of a chick's life has a most important bearing on the productiveness or otherwise of the stock. Without proper rearing the best pedigreed birds will fail. The hatching operations completed, the first thing to attend to is to destroy any and all deformed, weak, or sickly chickens. A good nurse is not required in poultry-raising.

THINGS TO REMEMBER.

The system I now give may be considered too fiddling for big breeders, but I hold that for anyone raising not more than 500 or 600 a year the mortality returns will be less, and the vigor of stock greater than by any other method. Brooders I will have none of. I look upon them as unnecessary and, in the hands of some, as deathtraps. For the first three or four days, according to the temperature of the weather, the new arrivals are kept in the nurseries provided in the machines used by me. They are then placed in colonies of about 25 in unheated boxes about 24in. by 15in. by 9in., having a glass lid, sloping to admit the sun's rays and to throw the water off in the event of unexpected showers. The box is provided with an adjustable shelf at one end, about 9in. in width, padded on the under side (no "hanging" strips). The box is placed in a position of sunlight or warmth—according to the vagaries of the weather. It is surprising the warmth generated in the box, and ample ventilation is necessary to avoid sweating. A hole with a sliding door is made at one end, and after a day or two a small run, covered with small-meshed netting, is placed in front, and the chicks allowed to run in and out at will. This step must be taken in accordance with the weather. On the floor of the box is placed a sugar bag covered a couple of inches deep with coarse sand and litter, into which all dry food is placed; and soon the chicks are working hard for their living. If the nights are cold the boxes are brought under cover. I have frequently placed three-day-old chicks outside in these boxes, and never brought them in once. I hold that in this climate artificial heat is unnecessary, especially for early-feathering breeds, and robust youngsters will thrive amazingly under the treatment described. If you try the system it will surprise you how warm and contented the chicks are. The squeaking chick is unknown. The youngsters are gradually passed along into "wigwam" houses, with open runs attached, the box being still used as a warmer. At three or four weeks nothing is necessary but a box open on one side. Separating the sexes should be done as soon as the cockerels show up. Cockerels have a way of getting most of the titbits.

CULLING.

Culling cannot be too severe. A weak or sickly bird patched up brings trouble sooner or later. Keep the stock active and moving. Young birds intended for layers cannot have too much exercise. Move the chicks frequently into new quarters. Cleanliness saves a heap of trouble. When about one month old the youngsters are let out daily for an hour for a run on a lucerne patch. They soon get to know their turn, and that it is necessary for them to make the most of their opportunities. Observation plays a great part in the successful raising of stock. The observant man can readily decide what variation in treatment is required to push birds on. At four and a half to five months the result of care becomes apparent. The pullets come into shape, and the reward for care and labor is obtained.

FEEDING.

For the first 48 hours no food is required. The first meal should be coarse oatmeal or flaked oats. Brown bread dried in the oven and desiccated is also good. This feeding should be continued for the first week. I have read authorities who state that it is necessary to teach incubator chicks to drink by dipping their beaks in water; but the chicks I am used to at three days old know about as much as they will ever know. Give green feed from the jump, cut small (soft grass for preference). Earthworms are given, and provide much healthy exercise; and many an amusing tussle takes place. Do not use the prepared foods generally sold. I would rather use my own mixture, and vary according to growth. Flaked oats, millet, canary seed, and cracked wheat are used principally. Fine granulated charcoal, grit, shell grit are always present in the litter. After the first week the quantity of cracked wheat is increased, until at three weeks it forms the main staple.

SOFT FOOD.

As to soft food, I have given small quantities after the first week, gradually increasing the amount. It stretches the crop, and is quickly and easily digested. Moderation is the great thing in feeding soft food. Green feed is a most important, if not the most important, item of the chick's menu, and it should be freely given—as much as they will eat. The rations are graduated until at five or six weeks old the birds are on adult feeding, the only difference being the occasional use of hulled or rolled oats. Meat in the form of boiled liver, minced, is given after the first week, beginning with infinitesimal quantities and gradually increasing. Do not strain your capacity. Small colonies do best. Fifty well-reared chicks will give much greater satisfaction and more profit than 100 raised anyhow. If you are starting, start small and work up. In poultry-keeping, as in other things, the man who attempts great things before he has learned the rudiments is doomed to sure and certain failure.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on April 13th, there being present Messrs. J. W. Sandford (Chairman), J. Miller, R. J. Needham, C. Willcox, Col. Rowell, C.B., A. M. Dawkins, and W. J. Colebatch.

Professor Angus forwarded the following report on "takeall":—

As promised some considerable time ago, I now submit to you a short statement with reference to the disease known as 'takeall' in wheat. This statement has been taken almost entirely from the reports published by the Pathological Section of the Agricultural Department, Melbourne—the only literature available on the subject in Australia. This report would have been submitted to you some time ago but for the fact that provision was made on this year's Estimates for the appointment of an officer competent to deal with subjects of this kind, and I was hoping that by this time this officer would have been at work in the Department. Unfortunately nothing so far has been done in the matter by the Government. In the 1903-4 season a large area of country was affected by this disease in Victoria, and afforded Mr. McAlpine and his staff a splendid opportunity of studying it. He speaks of it as "strips and patches in which the wheat plants seem to have been arrested in their growth, and in these there were only miserable, stunted, specimens dying off in various stages while still in the blade." Again, as the season advanced, it was noted that wheat plants which promised well and had fully formed heads did not develop grain, or if they did, it was shrivelled and almost valueless. The plants were not only dead at the top, but also from the root upward, and the whole had a bleached appearance so that the name of "whiteheads" has been given to this disease from the striking appearance of the plant as if prematurely ripe.

These two conditions, Mr. McAlpine reports (*i.e.*, the "takeall" and "whitehead" conditions), are both different stages of a diseased condition of the plant, caused by the same fungus which occurs at the base of the stem and on the roots. This disease he speaks of as *Ophiobolus graminis*. This disease is neither confined to Australia, nor is it of recent occurrence. So far back as 1868 we find it inquired into by Commission in South Australia here. It has been reported on in almost every country in Europe, and also latterly in America. There are, however, other causes which bring about the dying off of the wheat plant besides that due to the specific disease above mentioned, but in this State there is no getting away from the fact that for several years a large area of wheat country has been affected by what is known as the true takeall, and great loss has been sustained thereby.

It is unnecessary here to go into the details of Mr. McAlpine's work in tracing the life history of the fungus or in his infection experiments. Suffice it to know that he has successfully proved that this fungus, *Ophiobolus graminis*, is the cause of takeall in wheat; that it can exist on wheat-growing land from one season to another, living on the stems of the plants; that it can attack crops sown on land so affected; and that infection can be carried from one year to another by at least two of our common grasses, viz., spear grass and barley grass. These facts, I think, have been proved by Mr. McAlpine beyond doubt.

TREATMENT RECOMMENDED.

This part of the subject has been so ably dealt with by Mr. G. H. Robinson so recently as 1907 in the Victorian *Journal of Agriculture* that I think it only fair to him and quite meeting the requirements of the present case to submit to you the whole of his article known as "Takeall and its Control."

"A dry summer followed by a wet winter seems to afford the most favorable conditions for the development of takeall and whiteheads in our wheat crops, diseases which have been shown to be due to the attack of the fungus known as *Ophiobolus graminis*, Sacc. Takeall is the result of a virulent attack of the fungus arising from infection at a very early stage in the life of the wheat plant, and it is scarcely possible to mistake the disease for any other. If patches, not being claypans, are seen on which nearly all the plants are dead, a number of stools both large and small should be lifted and the earth carefully washed away from the roots. If in a considerable proportion of the plants thus washed the butts for an inch or so appear quite black, and low down on the inside of the outer sheaths small black bodies about the size of pinheads are seen, then it is practically certain that the takeall fungus is the destructive agent, particularly if the roots have a tendency to break off close to the butt when the plants are pulled. The blackened appearance of the butt, it may be noted, is much more easily seen when quite wet. A milder attack of the fungus, producing the disease known as whiteheads, is not so readily recognised, since it is often confused with tip-burn, a condition in which the upper portion of the heads turns white and fails to produce grain, while the lower portion of the ear yields normal grain. In whiteheads, however, the whole of the ear is white, and of much the same color as the rest of the plant, and what little grain is produced is poor and shrivelled. Tip-burn thus is the death of a portion, rarely the whole, of the ear, the other parts of the plant remaining alive, and is due to a scorching wind during the flowering period, while in whiteheads the whole plant dies as the result of the attack of a fungus on the roots and base of the stem.

"Though much has been done in working out the life history of the takeall fungus, still our knowledge is incomplete, and as a consequence the measures recommended for its suppression might perhaps be improved upon as the result of sustained investigation and experiment under ordinary farm condi-

tions. Laboratory work is an essential to success, particularly in the early stages of an investigation, but sound, practical measures for the control of diseases are what our farmers and fruitgrowers require, and these can only be devised as the result of comprehensive field experiments.

" At present we know that the takeall fungus produces little black flask-shaped bodies, called "perithecia," on the sheath of the wheat, containing an immense number of spores, and these spores are capable of germinating at once if sufficient moisture and air be present. As was shown by experiment three years ago, if diseased stubble be placed in a pot and healthy wheat sown with it, the young seedlings are seen to be diseased almost as soon as they appear above the ground, and in as short a time as two months from date of sowing the plants may be all dead and their blackened butts covered with the perithecia of the fungus. Thus if wheat be sown on land bad with takeall the previous year, we may expect the resulting crop to be diseased, in all probability much worse than in the first case, since the conditions favoring the germination of the seed also favor the germination of the spores. As this result invariably occurs in farming practice, it is clear that the disease known as takeall arises from the spores of this fungus remaining in the ground from the previous year.

" Some consideration will be given to the methods generally adopted for combating the disease, and an effort made to show the reason on which they are based. Summed up the measures may be described as starving the fungus, which is achieved as follows :—

- " (1). Avoiding wheat after wheat.
- " (2). Burning badly-affected stubble.
- " (3). Early fallowing with thorough working after rain.
- " (4). Replacing wheat with some crop, such as oats, not liable to the disease.

" THE VALUE OF EARLY-WORKED FALLOW.

" Of late years the practice of taking off only one wheat crop every three years has become fairly general in the northern districts, the stubble being allowed to stand after harvest, such feed as may spring up serving as pasture. In the second winter, or spring succeeding the wheat crop, the land is fallowed and in the following autumn wheat is again sown. This year takeall has been worse than in any year since 1903, when the first season after the drought was experienced. Bearing in mind the frequent practice of one wheat crop in three years we find that many of the paddocks in which takeall was so bad this year was seriously affected in 1903. Taking such a paddock to illustrate our argument, the conclusion is obvious that the fungus has by some means survived in the land for three years, for we are certain that it is not carried by the feed. What we have to find out is how has it survived? We have a few facts to guide us in seeking an answer to this question, but must depend

largely on conjecture. We may dismiss at once the possibility that any of the spores produced on the wheat stubble of 1903 have survived till the autumn of 1906 and then infected the newly-sown wheat, for the remains of that crop, stubble, fungus, and all, must long since have been merged into the general substance of the soil. Of course during the year the paddock was in grass there must have been a number of self-sown wheat plants, many of which would be diseased. These would give us on their dead remains spores in the autumn of 1905 capable of attacking wheat, but there is no likelihood that there were any living wheat plants in the paddock during 1905 for these spores to attack, so that unless the fungus was able to grow on some plants other than wheat it would be starved out; hence we should expect a year in grass and a year in fallow to banish the disease. This, however, as all farmers know, is not often the case, but an explanation is afforded by the fact that two at least of our most common grasses, both practically worthless, or at best not so valuable as others capable of growing under similar conditions, are known to be attacked by this fungus. They are the spear grass (*Bromus sterilis*) and barley grass (*Hordeum murinum*), while a third, sometimes called silver grass (*Festuca bromoides*), is strongly suspected of being affected also. The two former, unfortunately, are rarely if ever absent from our wheat paddocks, and it would be safe to say that there is no district in Victoria where they are not abundant. These two grasses known to be attacked form a considerable proportion of the herbage springing up in stubble paddocks, while the silver grass is far away the most common on such land. Doubtless spear grass and barley grass serve to carry over the disease, in such cases as that cited, to the autumn of 1906, furnishing spores ready to attack the newly-sown wheat. But, some may argue, the bare fallow in 1905 will have destroyed all the grass long before the wheat was sown. Certainly after a year's pasture an early fallow before any other grass had time to mature their seed or the fungus to produce its spores, a fallow well worked through the summer, would go a very long way towards starving out the fungus, but, owing to various causes, much fallowing is done too late to be of any service in this direction, and still more, perhaps, is never touched at all before seeding. A late fallow permits the fungus to mature its spores on the grass and these spores would form the source of infection for the crop sown in 1906; hence the importance of early fallowing to check takeall and the uselessness of a late one.

"Working the land after a rain through the spring and summer is almost as important as earliness in fallowing. Even in an early fallow there is the probability that a few autumn grown grass plants would have a small proportion of spores formed on them, and the only way to destroy these spores is to set up conditions similar to those existing in a good seedbed. By working the land after rain air is admitted and moisture conserved, furnishing conditions favorable to the germination of these spores, and since there is nothing for them to grow upon they soon perish. On the other hand, if the ground remains

unworked it quickly becomes dry and hard, so that it would be impossible to conceive conditions more favorable for the preservation of these spores uninjured, and in a fit condition for attacking newly-sown wheat in the autumn.

"BURNING STUBBLE."

" Burning stubble is not such a common practice as it once was, the growing recognition of the value of the straw being responsible for the change. Badly-affected paddocks are best burnt off, but this operation must be carried out with some understanding of the object in view—the destruction of the spores of the fungus. In the first place, the usual method of burning off is quite useless, since the takeall patches being almost bare of anything in the way of dry straw a proper burn is never obtained over the parts where it is wanted, but only where the disease has not appeared. The harrows should be run over the stubble to draw straw to the bad patches and the burn off accomplished as early as possible in the season.

"REPLACING WHEAT WITH A CROP NOT LIABLE TO THE DISEASE."

" Oats are frequently grown after badly-affected wheat crops, often with considerable success in starving out the fungus, but occasionally the results are unsatisfactory. We know that the fungus cannot grow upon oats, and its reappearance after oats in some cases has led to doubts being cast upon this method of controlling the disease. These varying results, no doubt, arise from the different conditions under which the crop may be sown, and the cleanness of the seed. In the first place the seed of spear grass is present to a greater or less extent in practically all samples of oats; hence, as a rule, a proportion of spear grass is sown with the oat crop, and as there is already some present in the soil of nearly every paddock, we are not pursuing a wise course in sowing oats after wheat and then wheat again without an intervening fallow. By all means use oats where practicable, but be careful to sow clean seed, free from spear grass, and preferably after an early fallow and not directly after wheat. Sometimes, however, it becomes necessary to follow wheat with oats, in which case wheat should not again be sown without an early fallow in between. In very badly-infected paddocks it is well to replace wheat with oats, for once in the ordinary three-year rotation of grass, fallow, crop, the succeeding treatment depending largely on the nature of the season and the financial requirements of the farmer.

"TAKEALL ON NEW LAND."

" One point alone remains to be discussed, and that is why land never in wheat before sometimes gives a crop badly affected by takeall. There can only be one explanation and that is that the grasses which it carried before must have borne the disease. The necessity for early fallow is again

shown, and thorough working to prevent the growth of weeds which may carry over the fungus, and to cause the germination and destruction of the spores.

"CONCLUSIONS.

"From what has been already said regarding the prevalence of the disease on spear grass and barley grass, which are practically always present in our crops, there would appear to be no use in allowing affected paddocks to remain in grass for one year in three so far as destroying takeall is concerned. It would be a much more rational course to burn off the stubble thoroughly and fallow early, work the land well, and then put in oats, to be followed by another fallow and then wheat. The second fallow might be omitted if the season promised well and the autumn rains had been insufficient to ensure a good germination of the self-sown oats and various weeds. Of course, where rape or any other green crop can be grown with any degree of success, it might be used in place of oats, since it would answer as well or better. The only reason for suggesting oats is that on a large section of our wheat lands the growth of any other crop but a cereal has been regarded as next to impossible, and this one, at least, is not susceptible to attack by takeall.

"To sum up: as far as our present knowledge goes takeall can only be controlled by starving out the fungus which causes it, and this is best done by fallowing early and working the land thoroughly after rain, and for a time replacing wheat by a crop not subject to attack. For each and all of these measures there are sound reasons as we have seen, and the degree of success achieved will depend largely on the care bestowed on the work."

It was decided to thank Prof. Angus for his report, and at the same time to express regret that he had not been able to furnish any data concerning his own investigations into takeall in South Australia.

The Secretary reported that he had written to the proprietors of the *Advertiser* and the *Register* in reference to the publication of market prices for currants. Prices were now being published in both papers.

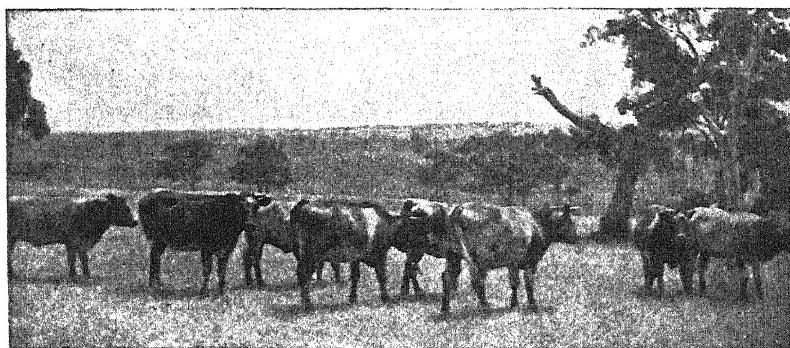
The Board indorsed the recommendation of the judges of the stone-gathering trial that the amount of £50 should be awarded to Messrs. J. & R. Forgan. It was resolved that the makers be advised that the Board particularly urge the makers to exhibit this machine at the September Show, and also that the Principal of the Agricultural College would be glad to afford them an opportunity of showing the machine as work on Farmers' Day at the College.

The following gentlemen were approved as members of the undermentioned Branches:—P. C. Roberts, Penong; W. Chittleborough, G. Foster, W. J. Forster, T. J. O'Brien, J. Canacher, E. L. Atkinson, G. Holmes, J. Feineler, V. Redman, and G. Slade, Frances; J. Botterill and H. Wheeler, Mount

Gambier; J. P. Heggie, Angaston; H. E. Hatherly and H. R. Edwards Mount Bryan; E. A. Jellett, Tatiara; A. Jamieson and T. Keatley, Yongala Vale; R. G. Williams, Mount Bryan East; J. J. Spurr, Shannon; H. Towill Forster; W. Fricker, Arden Vale and Wyacca; W. Ward, W. Carrick, and J. Head, Mitchell; A. O'Connor, Miltalie; B. A. Murphy, T. E. Henschke, and J. Carr, Hookina; G. Prentice and F. Johnson, Uraidla and Summer-town; H. Francis, Sutherlands; H. Haines and N. Guidera, Utera Plains; H. M. Koth, Kybybolite; J. McGlashan, Salisbury; Dr. E. J. Frayne and H. Webb, Mallala.

Mr. Dawkins said it was worthy of consideration whether they were doing all they should in regard to forestry. There was no doubt that the timber question was going to be a very serious one in the near future, and the Government and the people generally should give it earnest attention. While they all appreciated the work of the Forest Department he thought they would agree that funds should be provided to extend its operations. He thought it would be a good plan if the Government reserved forests land where each of our native timbers of value flourished—in the Mount Lofty hills the stringybark, in the Barossa Ranges the redgum, and so on. On the blue soil flats around Roseworthy the peppermint used to flourish, and he thought it a pity that a portion of this country had not been reserved as a natural forest.

Some discussion followed, members indorsing the views expressed by Mr. Dawkins. The Secretary pointed out that in Victoria the stringybark was being used more and more for fruit cases, and there was a considerable demand here. Only that week a gentleman engaged in that industry had referred to the extent to which good stringybark timber had been thinned out in the more accessible parts of the ranges, and had expressed the opinion that any good timbered block would, in the course of a few years, be a valuable asset to the owner.



AGRICULTURAL BUREAU CONFERENCE.

SOUTH-EASTERN BRANCHES.

The Annual Conference of the South-Eastern Branches of the Agricultural Bureau was held at the Institute, Bordertown, on Wednesday. Mr. C. W. Saxon (Chairman of the local Branch) presided, and there were present in addition Messrs. C. Saxon, R. Reschke, T. Stanton, J. K. Bond, H. and E. W. Milne, E. W. Prescott, A. Wilson, J. Kirby, W. Campbell, L. Duncan, M. O'Shea, A. Fisher, C. Staudie, G. Steer, and T. L. Truman, of Tatiara Branch; Messrs. J. C. Ruwoldt and A. A. Sassanowsky, Mount Gambier; Messrs. J. G. Forster and S. H. Schinckel, Naracoorte; Messrs. J. B. Makin and W. Dall, Keith; Messrs. J. W. Sandford (Chairman), J. Miller, and W. L. Summers, of the Advisory Board of Agriculture; W. J. Colebatch, M.R.C.V.S., A. E. V. Richardson, B.Sc., G. Quinn, and Veterinary Surgeon Desmond.

The Chairman extended a hearty welcome to the delegates, especially the representatives of the Advisory Board of Agriculture, whose presence indicated that they were keenly alive to the nature of the work which was being performed by the various Branches. He regretted the absence of Professor Angus. It was gratifying to be able to announce that the Tatiara Branch had made good headway in recent years, and now numbered 20 members. After having referred to the excellent seasons which the agricultural community had enjoyed recently, and the important part which the farmers had played in the progress of the State, Mr. Saxon paid a tribute to the work of the Wheat Commission and the Chairman (Mr. Coombe, M.P.), and hoped that the incoming Government would emulate the example of the present Administration in the matter of opening up agricultural land. (Applause.)

At the conclusion of the introductory proceedings the visitors spent an instructive half hour inspecting the numerous exhibits, consisting of fresh and preserved fruits, fodder plants, grains, wool, &c. The manager of the Murray Bridge Experimental Farm tabled an instructive exhibit of green fodders, and special interest was shown in the different varieties of lucerne. The contrast in the growths of these varieties over the same period of time was very marked.

Mr. J. W. Sandford (Chairman of the Advisory Board) in a short address congratulated the members on the display of products, which was a splendid testimony to the fertility of the soil and the enterprise of the growers. From what he had seen there was no doubt that the South-East had a great future. In the officers of the Agricultural Department they were fortunate in having

gentlemen who were experts in their respective spheres, and were at all times ready to give practical assistance and advice. The Advisory Board did what it could to help the agriculturists, and was always pleased to accept suggestions from Branches of the Bureau. These did a remarkably useful work, and from every aspect were without their equal in any other part of the Commonwealth. An idea of the magnitude of the organisation could be gathered from the fact that the Branches numbered 120, and represented several thousand members. In Mr. W. L. Summers (the Secretary of the Board) they had an exceptionally energetic, able, and enthusiastic officer, whose efficient services could not be overestimated, and in whom they had a worthy successor to their late friend, Mr. Albert Molineux. In conclusion Mr. Sandford referred to the value of such Conferences as that, but emphasised that unless the fullest use were made of the information given they could not expect to reap from them the best results.

PICKLING WHEAT.

Mr. J. S. Foster (Naracoorte) dealt with this subject as follows:—

"Having noticed a lot of writing on the different modes of carrying out the above, it struck me the experience I have had may be of use to someone. In the years 1850 and 1860 my father used to put a lot of labor into the pickling of his seed wheat. The quantity grown was not great in those days, or he could not have put the labor into it. The pickle then was hot limewater. The wheat was in a heap on the floor, and the liquid thrown over the wheat, and free use of shovels until the whole mass was thoroughly wet. The next day it was bagged and sown. The bagging was unpleasant from lime fumes; but hand-sowing the wheat after it was dry was a caution for the eyes, mouth, and nose. But the crops were good; there was very little smut. At this time bluestone had not come into use. Later the wheat was wetted with bluestone liquid and dried with lime. I knew of one farmer who used to save the urine from the bedchambers for some time before seed-ing. He had no smut, but always good crops. I was not enamored of this method when the responsibility of pickling wheat fell to my lot. Bluestone had come into use, and was much easier handled; although, compared with lime-pickled seed, the crops were not nearly so good. The first Professor of Agriculture in South Australia had stated that wheat pickled in a strong (float an egg) salt brine was a preventive of smut. Wishing to get away from bluestone, which I was sure did not encourage the germination of wheat, I followed that advice; but not again. I had enough smut to satisfy me that all professors are not to be relied on for all they profess. Some Northern farmers have told me they do not pickle their wheat for early sowing and changing of seed; but the South-East climate will not allow that mode of farming."

"Wheat, barley, and oats require pickling to insure freedom from smut and blackheads. I notice our agricultural officials are experimenting with other kind of pickle than bluestone, and I shall be pleased if they succeed in proving

a sure preventive of smut with less detriment against germination possessed by bluestone pickle, as I have proved with the latter—too strong, or wheat left in too long—the wheat will be killed. Once, using two tubs one above the other, I forgot to drain the bluestone liquid off for 12 hours. As an experiment the seed was sown half a bushel thicker than the rest, but not a grain grew.

"There are several ways to pickle wheat. Firstly, on a floor—either natural earth, concrete, or board—sprinkling the wheat and shovelling until the whole mass is thoroughly wet. This plan takes a lot of liquid. Secondly, a hogs-head cask cut in half placed one above the other, the top one with a cork hole with fine netting to stop the wheat running through, the bottom one with liquid. Nearly fill the top tub with wheat, and dip the liquid out of the bottom tub into the top one. When sufficiently steeped, draw the cork. Thirdly, a large cask containing liquid, two gunny bags, a pulley above the cask, a sheet of iron sloping into the cask. Put wheat into one gunny bag, dip into liquid; when sufficiently steeped pull up on to sheet of iron, and, whilst draining, fill the second bag, and so on. The objections to the three foregoing plans of pickling wheat are that the wheat has to be handled so many times, emptying, refilling, &c.; consequently any balls of smut are very likely to get broken and distributed through the whole. Fourthly, the plan I have followed for years. In my opinion the quickest and least likely to break any balls of smut if there are any in the wheat is to put the bags into a dip. If bags are well-filled, take about a gallon or so of wheat out and sew up again, so that the bag is loose. I use a dip made trough shape, part of a hollow log, 3ft. 6in. long, and 2ft. wide at the top, 2ft. deep in centre, about 7 cub. ft. at water level; will hold about 43galls. half full, and will cover a bag of wheat when immersed. In starting I dissolve 2lbs. of bluestone by boiling, then for any additional water I keep some bluestone in a coarse bag in one corner of the dip. I leave the bag of wheat in the liquid for about five minutes. Have a stage covered with corrugated iron sloping into dip, and if a large quantity of wheat is done at a time have two sheets long, when you can keep rolling your bags on as they drain. For lifting bags out of dip I use double block tackle and short chains with ring at each end to slip over bag when stood up in dip. Three-bushel bags are easily handled by one ordinary man."

"In following the foregoing I have never been troubled with smut, unless a very wet season on black land; then a few balls may be found. Although last season was wet I had no smut."

Mr. C. H. Towns (Nhill) was of the opinion that if the farmers could secure a reliable guarantee with the article formalin would be the best thing to use in pickling wheat. Mr. Richardson said that in treating grain it was absolutely imperative to use a proper strength of pickle, and to sow the seed immediately after treatment. If this were not done the germination of the

grain would be seriously interfered with. Experiments which had been conducted by the department had demonstrated that a 2 per cent. (that was 2lbs. to 10galls. of water), $2\frac{1}{2}$ per cent., or 3 per cent. solution of bluestone was quite sufficient to prevent smut. Personally, he thought that the best proportion was the 2 per cent. He was impressed with Mr. Towns' comments concerning formalin. The department had recently purchased some formalin supposed to be 40 per cent., but a test in the laboratory had shown that it did not go more than 23 per cent. If the department could not get the pure article, how could they expect the farmers to know when they got the true thing at the time of purchase? A pound of formalin to 40galls. of water made an efficient smut preventive. The formalin undoubtedly had advantages over the bluestone, in that it did not require a wooden vessel, and did not delay the germination. So far as fungisine was concerned, although the experiments conducted by the department had proved satisfactory, he would recommend its use, at present, with a deal of caution. Mr. J. Miller did not think that bluestone could be beaten as a pickle, but considered that if farmers desired to secure the best results they should sow their grain early. Mr. W. J. Colebatch, was of the opinion that formalin as a pickle should receive more attention at the hands of the farmers, especially in those districts where bluestone had not been altogether successful. He felt that under existing conditions sufficient care was not taken to ensure exactness in the proportions of the pickle. He was a strong advocate of the method of pickling on the floor, and hoped that sulphide of potash would be included in the trials of fungicides that were being made by the department. Mr. Quinn laid stress on the necessity for thoroughly wetting the grain in the process of pickling. Simply dipping the seed did not ensure that the grain was wetted all over. Mr. A. A. Sassanowsky mentioned that the only pickle they had used was bluestone, which had proved exceedingly satisfactory. They used two casks, weighed the wheat carefully, and immersed 2bush. at a time for two minutes or two and a half minutes. Then they removed the bag, placed it on top of one cask, and allowed the pickle to drain off. They used 1lb. of bluestone to 10galls. of water, and found that the process did not interfere with germination. Mr. Richardson, in answer to the Chairman, said the best rule was to sow the grain almost immediately after pickling. If they used formalin the grain should be sown within three days. Mr. W. L. Summers said it was probable that a Bill would be introduced this session to deal with insecticides and fungicides for the protection of the buying public. Recently, in some experimental plots, Flinders wheat, in five districts, had shown smut, though other kinds, all pickled alike, had been free of the fungus. He thought that there was ground for the views held by some farmers that some varieties were more liable to smut than others, and also that the season affected the pickling results. Mr. Richardson said a good deal had to be attributed to the individuality of the grain. What

he wished to emphasise was that what would kill the spores in the Adelaide district would also kill the spores in the South-East.

EXPERIMENTAL AGRICULTURE.

Mr. Colebatch delivered an address on "Experimental Agriculture." He was opposed to the practice of leaving the experimental work of the department to the farmer, because as a rule a farmer was not aware of the degree of accuracy necessary for the successful carrying out of that work. Unfortunately, the best men among them were unable to eliminate entirely the errors that would creep in, and unless the work was performed by officers specially set apart for it the errors would approximate 15 per cent., while in some cases they would reach fully 20 per cent. He was looking forward to the day when these experiments would be conducted by the Government staff, which, however, would have to be increased considerably, for they would have to do the work from start to finish. Until that position was reached it would be advisable to exercise great care and judgment in translating the evidence gained by experimental fieldwork into every-day farm practice. As a stepping-stone in the direction indicated he was anxious that the Government should allow him to employ a couple of Roseworthy graduates as cadets for two or three years. He had already placed the matter before the Minister in black and white, was going to press it, and wanted the conference to back him up. There would not be any difficulty in selecting suitable diploma lads, who would be all the better for a year or two's continuous work in the department on experimental lines, and the expense incurred would not be large. Eventually he hoped to secure an extension of the State farm system, apart altogether from the farmers' blocks, so that all the experiments could be carried out in a thoroughly reliable manner and on a permanent basis. So far the farmers in the South-East had treated him well, but it was not to be expected that they would neglect their own operations to attend to the department's blocks—a course which might be necessary to achieve the results aimed at. Still, they wanted to have the farmers with them in spirit and not merely for what they hoped to get out of the experiments; and if they could not carry out the work in the way required, he trusted that they would acquaint him with precisely what had been done. The greatest care had to be exercised in laying out the plots so that the exact amount of seed and manure could be placed on each plot. This year he proposed to carry out some experiments on land similar to the white sand country between Custon and Frances. The block was near to Binnum, where he would use 10 acres, to see if it were not possible, by continuous green manuring, to bring that class of land into cultivation. He intended to continue the work for several years, and had an idea that the land would one day grow turnips and potatoes, so that the experiments had some importance to the district. For the farmers further

south he intended to carry out experiments with potatoes. He had arranged to get seed potatoes from a man who was probably the most up-to-date grower in the State. That producer would supply seed, half of which would be stored in some dark place, as was done usually by the average farmer, and the other half would be stored and sprouted on trays under shelter and exposed to the light. He wanted to test the seed kept under different conditions. A few years ago the Irish Department of Agriculture had carried out 34 experiments, with the result that a difference of over $2\frac{1}{2}$ tons in favor of the properly sprouted potato had been obtained. The samples would be sent to the members of the Agricultural Bureaus, and he would ask them to assist him in the work which he had planned.

Questioned by Mr. Towns, Mr. Colebatch mentioned that the area of each block provided by the farmers was about five acres. In every instance, however, he had tried to secure duplicate blocks on the same farm, or as near to each other as possible. So far as the produce was concerned, he thought that if each farmer received one-fifth for his own use he would be getting his share. The Government should have the right to purchase at top market rates up to four-fifths of the crop. In answer to Mr. McIntosh, who wished to know what manure it was proposed to use on the land (if any), Mr. Colebatch said he was going to try superphosphate and basic slag, and expected to obtain the best results from the super. He did not believe in trying too many things at the one time.

Mr. Sandford asked what sort of potatoes Mr. Cloebatch proposed to plant. Undoubtedly the best potato ever grown in the South-East was the Brown's River, but it had failed because growers had persisted in planting from the same seed year after year. Eventually they had gone in for other sorts, but now they were shrinking in their yields, and he felt that unless this matter was grappled with at once, and a potato found suitable for the South-East, Mount Gambier as a potato-growing district was doomed. Tasmanian farmers were rushing their potatoes on the market, fearful of a recurrence of what had happened last year, and he warned growers to be careful in their purchase of seed. The Tasmanian potatoes were well suited for conditions in the hills country, but he did not think they would do well in the South-East. The Gem of the South, from which great results were expected, had been almost a failure in the South-East, although the earlier lots in Tasmania had given enormous yields.

Mr. Colebatch said in potatoes they were always changing and improving. He was in hopes that the system of storing the seed that he had in view would have important results. If it should prove a success he thought it was time the Government established a seed depot in the South-East, which would give the farmers the same chance with potatoes that they now had in relation to wheat—that was to secure the best seed.

Mr. Richardson said there were two sorts of experimental work—scientific work, that should be conducted by men such as Mr. Colebatch described. Then there was practical demonstration work, that farmers could do. He should like to see farmers carry that out on a large scale in, say, 20-acre blocks. In New South Wales there were 15 experimental farms, on which trained men were engaged to conduct the scientific and skilled investigations, and there was also a demonstration branch in the department, which tried to test on a larger scale the results obtained on the small plots. The system had been attended with magnificent results. The sandy land referred to Mr. Colebatch occupied a large part of the South-East, but such country had been turned to great advantage in Victoria, and also near to Perth. Similar land at Brighton had been transformed in Victoria into one of the best regions in the State, made fertile by manure from the Melbourne stables. What was necessary was to introduce organic matter into the soil.

Mr. Colebatch maintained that in the proper conduct of experiments trained men were absolutely essential, and he looked forward to the time when he would have full control of the men actually engaged in carrying out the work. It might be said that the men on the land had an advantage over young lads from the College, but, from his point of view, the latter had a distinct advantage over the former, in that they would do exactly what he told them, while the others might not.

THE FARMERS' FRUIT GARDENS.

Mr. Geo. Quinn read the following paper :—

My reasons for bringing this subject under the notice of this Conference are twofold. In the first place I desire to appeal to the mercenary side of human nature to show how physical and possibly monetary gains may accrue from the attention given to fruit-raising on the farm, and secondly, the advantages likely to arise either directly or indirectly in the form of a mental uplift and stimulus based upon a closer and more continuous contact with plant-life than is possible with annual crops only.

If time permitted I should have preferred to enlarge upon the title of this paper and have included other branches of horticultural work such as the production of kitchen vegetables and the growth of ornamental and sheltering trees and shrubs, as well as the raising and care of garden flowers. From a casual viewpoint these may savor of entering the domain of the despised Chinaman, or stooping to the effeminacies of womankind, but a closer contact with these plants reveals lessons the value of which is not generally suspected. Perhaps we do not often consider that it is through horticulture that we owe the great variety of our daily food, and without this art the decorations of our homes, both internally and externally, become very commonplace indeed. Let us not forget that in all ages mankind

has marked his advance in civilisation just in so far as he advanced in the practice of this art.

The Selection of a Site.

In the selection of a position for the farm homestead usually other considerations than the suitableness of the place for the establishment of a garden prevail. The healthfulness from a residential point of view or its centrality from which to conduct the various operations of the farm usually take precedence. There is the consolation, however, to him who is determined to possess a garden that the small area of soil needed for this purpose may be made good in most instances, even although it be very poor at the outset. An unsheltered spot may be sheltered by the growth of hardy trees, or hedges, or even by the erection of inert breaks such as are afforded by close fences. If one may choose a site I would suggest the desirability in this climate of placing the question of moisture before that of richness of soil. In those portions of our State with an annual rainfall of not more than 20in. the low-lying hollow is usually preferable to the rising ground favored in districts of abundant precipitation. For the successful growth of fruit trees richness of soil in plant foods is not of such vital importance as good texture and sweetness, which enable root activities to proceed uninterruptedly over a long period of years.

Shelter from the forces of the winds—be they hot and desiccating, or cold and cutting—is probably of greater importance to the wellbeing of fruit trees and the formation and preservation of their crops than richness of soil and great abundance of soil moisture. The well-sheltered tree has not to expend its energies in repairing or renewing its injured twigs and foliage; neither does it call upon its roots to draw so heavily upon the moisture in the ground. We may therefore conclude that after selecting a site for the garden the first consideration is soil moisture in relation to its over-abundance or scarcity; the second, shelter from violent winds; and the third, the nature of the soil in relation to richness.

If a living shelter of trees, or hedges, be decided upon, the nature of the shelter to be provided depends largely upon the available moisture. Fortunately we have a fair choice of trees and shrubs suited to our climate from which to select; but a rule worthy of consideration is that the shallower and drier the soil the greater distance away should the sheltering trees be planted from the fruit trees. In average soils pine trees of the *Insignis* or Aleppo kinds should not stand nearer than 50ft., whilst sugar gums and pepper trees should be given a clear chain of 66ft. without fail, or they will kill off the fruit trees. Hedges of Boxthorn, Tagosaste, Kaffir Apple, Tamarisk, or Pittosporum need from 30ft. upwards of a headland. In the South-East probably the Kingston Sheoak or Casuarina, or the silver fern-leaved Acacia would make a good break. In forming a shelter it is always desirable to plant a narrow belt of nearly a chain in width, consisting of several rows, set

alternately, so as to form squares in preference to a single row. In a windy position, where the garden adjoins the dwellings, such a shelter belt may be carried right around the homesteading with comfort and advantage to the inmates as well as tending to the beautifying of the place. The method commended for establishing such shelters is to plough and subsoil the land when sufficiently moist in the early or late winter, as found convenient, and to keep the surface scarified down to a fine tilth, like a well-worked fallow throughout the summer following. Early in autumn the places for the trees should be pegged out, shallow holes dug, and the trees planted.

For hedges, trenches may be taken out, say, 2ft. wide and 15in. to 18in. deep. This can usually be done most expeditiously by means of a plough and a pair of horses, with a couple of men following in the trench with long-handled shovels to keep the trench open. The bottom or subsoil is not lifted out of the trench.

If the small gums or pines, which are obtainable free from the Forest Department nurseries about August, be planted into 3-in. pots, or empty jam tins with a hole or two punched in the bottom of each tin, and placed in a sheltered corner and given constant attention, they make fine trees for setting out in early autumn—a time, unfortunately, when the Forest Department is not ready to distribute them.

Before proceeding further allow me to say that the farmer who attempts to establish a garden or a shelter belt of forest trees without first surrounding it with a fence capable of excluding the ubiquitous rabbit had better console himself at the very outset with the unwholesome fact that "trees won't grow there."

The lines of shelter trees should be planted in rows parallel to each other, either straight or curving, so that the soil between and around them for a few seasons may receive as good tillage as the fruit trees they are meant to protect. I would like to burn this fact deeply into the mind of every farmer in South Australia who plants a forest tree, for no operation is so universally neglected. I sometimes wonder whether the free distribution of forest trees without first educating the farmers and others how to plant and attend to them is of any more value to the State than if so much money had been spent in beating the air.

Preparation of Land for Fruit Trees.

A fruit tree is generally compelled to remain in one spot for many years; consequently it is desirable to make its location as well suited to the maintenance of healthy conditions as experience can suggest. For your annual crops the soil is inverted and swee end probably to the full depth, that the roots penetrate at least once between the removal of one crop and the growing of another. Further, your annual crop passes away before the strain of the summer's heat attains its zenith, or its roots have not penetrated to a depth unwarmed by the scanty rays of the winter's sun. The fruit tree must stand

through the winter with its roots buried deep in the soil. Perhaps if care be not taken in preparing the ground these roots may remain in a stratum filled with water from which the life-giving oxygen is excluded. On the other hand, in the summer season, when the rate of transpiration from the foliage and fruit is at its greatest, unless well prepared and tilled, the soil moisture has shrunk to its lowest degree; hence it becomes necessary to prepare in very wet localities to carry off the surplus moisture by means of open ditches around the plantation and possibly under-drains between some of the rows of trees. On the contrary, in localities with a scanty rainfall, surface ditches are desirable for conducting every available gallon of water into the garden land, where it may be absorbed into the subsoil in winter and afterwards held long into the summer by proper tillage. Ditches are cheaply made by plough and shovel, and where discarded red gum slabs can be obtained from sawmills very durable under-drains may be put down at trifling outlay. The processes of preparing the ground for planting fruit trees varies with the nature of the subsoil. It is generally held that the digging of holes wide and deep into stiff clay only supplies drainage wells into which the whole volume of water which falls upon or runs into the garden gravitates. The tree planted thereon or therein assumes the position of a plant placed in a flower-pot which has the vent choked, but unfortunately the tree cannot be shaken out of the pot to have its drainage set right until of course its only destination is the wood-heap.

Where the subsoil is open and porous, ordinary surface ploughing with holes to set the trees in, may not be much faulted, but on our average lands subsoiling to a depth of from 12in. to 18in. is desirable. If the land selected has been fallowed and worked over as much as described for forest trees, when the first soaking rain of autumn falls the subsoiling can be done with the greatest satisfaction. Generally speaking a plough with a mould-board fitted to turn a very wide furrow slice—12in. at least—should go first, taking out the soil as deeply as possible; coming behind this another single-furrow plough with the mould-board off (if a proper subsoil plough be not available) should tear up the bottom soil, leaving it in its natural position to be covered by the next surface slice cut by the turning plough. This is tough work, calling for strong horses and implements, and is usually a good test for the farmer's harness, more especially if it has been mended with fencing wire as frequently as it is reputed to have been. It is in work of this kind where the value of spiral spring hooks on draught chains are fully appreciated. The ground having been torn up in this ruthless fashion, and all roots and stones likely to interfere with implements removed, it may then be scarified and harrowed down to a fine surface tilth ready for setting out the trees.

Fruit trees are usually arranged on one of three systems, or, in other words, the area is marked off in such a manner that the adjacent trees stand at the corners of figures which represent either squares, rectangles, or triangles. Each of these systems have their advocates, but, excepting where the

boundaries of the area to be planted are irregular in outline—such as formed by creek banks, &c., when the septuple appears to advantage—the square has advantages over other systems, owing to its great simplicity. To the farmer who wishes to economise in his horticultural operations it is most important to arrange his trees over the area in the manner which facilitates the use of horse implements to the greatest degree, leaving only a very small area to be hand-tilled immediately around each tree. To this end a headland of not less than 30ft. wide should be kept free. The distances between the fruit trees may be varied according to the kinds, the richness of the soil, the available moisture, the method of training, and whether hand or horse tillage is to be utilised. As a general rule, 20ft. apart is suitable for most trees in our average soils, and as a farmer should be able to manure his garden freely and till it cheaply by horse power this is suggested as a suitable distance for a mixed plantation where the kinds are varied in vigor.

The land is staked out, the holes opened, say, 18in. square by 1ft. deep, and the trees (which have been obtained from a reliable nurseryman) are ready to hand. Let me say here that in buying fruit trees ask for yearlings, with about 2ft. to 3ft. of growth from the bud, and do not accept overgrown or aged specimens with stems as thick as pick handles and too long overall to cart home in the tip-dray. Trim the broken roots, and cut out dead and matted fibres, setting the tree about as deep as the soil marks indicate it formerly grew. Spread the larger roots around and down the sides of the small mound which has been made in the hole around the stake, fill in with fine soil, avoiding grass, &c., tramp down quite firmly over the roots when they are covered up, and hold the tree in an erect position whilst so doing.

Pruning the Young Tree.

If set out in May or June there is no hurry to prune the young tree for a few weeks. Then bruised shoots or broken buds become more readily detected. If the tree has a long, clean stem, with good buds on it, cut back to this stem, say, from 12in. to 20in. above the soil. This holds good particularly with stone fruits, for as a rule they shoot well from the stem. Apples or pears often have lost the buds from the stem, and branches already formed must be utilised. In every case the pruner should look for healthy buds on the stem, and if they are present in sufficient numbers cut back to the stem. If the branches are strong, and possess good buds near to the point of union with the stem, cut them back, leaving from three to six buds only on each branch. Short, weaker branches should be cut closer down than stout and longer branches. Retain from two to five of these branches, set at regular angles around the stem if possible, and cut the central leader out to where the top branch (which has been retained) joins it.

After pruning, the soil should be again lightly turned with the plough, and on the approach of summer scarified down to a fine tilth. At the same

time a space at least 4 ft. square should be dug around each tree, and when the sunny weather begins this area should be broken and pulverised with a digging fork or heavy pronged hoe.

During the first season or two this hoeing should be attended to most carefully, the object being to retain an open, sweet soil above the roots, and a supply of wholesome capillary moisture below them, whilst no weeds compete with the root system which is struggling to recover itself from the injuries due to transplantation.

What to Plant.

In a farmer's garden, where the fruit is grown for household use only fancy may be fully gratified in the selection of varieties. Luckily in this State a wide range of fruits offer themselves for almost every locality.

A fair choice of apple trees, consisting of, say, one of each of William's Favorite, Ribston Pippin, and Gravenstein for early eating, with Lord Nelson and Lord Suffield for kitchen use at the same period. Later kinds may be chosen from Jonathan, London Pippin, Sturmer Pippin, Rome Beauty, Stone Pippin, Rokewood, Nickajack (specially suited to wetter and colder localities), or Cleopatra, Dunn's Seedling, Dumelow's Seedling, Esopus Spitzenburg, Shockley, Scarlet Nonpareil, Strawberry Pippin, Cornish Aromatic for general positions.

Of these, Rome Beauty, Stone Pippin, Rokewood, and Nickajack are the long keepers, and should be planted in every farmer's garden. Of pears, Jargonelle (early ripening), William's Bon Chretien (known locally as Duchess), Beurre Capiaumont, Gansell's Bergamot, Beurre Bosc, Glou Morceau, Josephine de Malines, L'Inconnue, Winter Nelis, Harrington's Victoria, and Swan Egg offer a splendid choice. The longest keepers of these are Swan Egg, whilst Harrington's, L'Inconnue, Nelis, and Josephine keep in about the order given here. Of apricots, Oullin's Early and Moorpark fill the bill : the former is nice for early dessert, the last-named for jam, canning, or drying. Plums for dessert and preserving in various ways may be selected from Wright's Early, Climax, Wickson, Burbank (Japanese Hybrids), Angelina Burdett, Green Gage, Coe's Golden Drop, Reine Claude de Bavay, Jefferson, Prune D' Agen, and Fellemburg. Probably the best all-round plum grown is Jefferson, with Green Gage and Prune D' Agen close up. Peaches can be selected to ripen from December to April, Brigg's Red May, Triumph, Hale's Early, Mountain Rose, Elberta, Sea Eagle, Muir, Lady Palmerston, Salwey filling the bill in freestones. The best all-round peach is Elberta ; but it must be sprayed against curl leaf fungus. Let me suggest the early ripening kinds—such as the three first named—be left unpruned in winter after being shaped, and making the first two or three years good growth. The best early, medium, and late nectarines are probably included among Early Rivers, Gold Mine, and Stanwick. Of cherries—which need deep, rich, well-drained cool soils—Early Lyons, Biggareau Napoleon, Waterloo, and St. Margarets

fill the bill. White Genoa and Black Ischia are our choice of figs. Almonds—Hatch's Nonpareil, White Nonpareil, Brandis, and Peerless are good. The two latter are erect, tall growers, and bloom somewhat too early in cold localities. Amongst lemons Lisbon and Villa Franca are recommended. It may be mentioned, in passing, that the lemon produces a marketable fruit where the orange is only a thick-skinned acid delusion.

Of all oranges the Washington Navel stands easily first of the ordinary types. Malta or Blood, Mediterranean Sweet, St. Michael, Siletta, Rio, and Late Valencia all have special points of value. Of Mandarins, Dancy's Tangierine and Emperor are representative of the best close and loose skinned types, whilst of preserving oranges the Flat Seville and the so-called Poorman (which I believe to be a hybrid Pomelo) make the best marmalades.

After growing and fruiting 36 varieties of table grapes for 12 years, I would select the following:—Five blacks—Muscat Hamburg, Black Hamburg, Madresfield Court Black Muscat, Wortley Hall, and Black Malaga; three reds—Red Prince, Red Frontignac, Red Malaga; nine whites—Muscat Gordo Blanco, Waltham Cross, Belas Blanco, Raisin des Dames, Crystal, Sweetwater, Santa Paula, Sultana, Doradillo.

Care of the Trees.

Besides good tillage the trees must be pruned carefully, more especially during the first four or five years, to give them a good shape and framework. After that err on the side of under, rather than over, pruning, but keep the tops from becoming too dense. Whilst young, they require attention such as keeping erect if blown over, or carefully amputating broken limbs, &c.

Pests and Diseases.

These will come into home gardens as freely as to the commercial orchards, and a small efficient spray pump, purchasable for £2 or £3, will last a long time if cared for. The treatment of practically all our fruit pests is now well known. Let me say, in conclusion, it is desirable to first find out the pest which is troubling your trees, then obtain the approved remedy, and apply it at the right time and in the proper manner. For instance, arsenate of lead is meant to poison caterpillars of codlin and other moths and beetle insects which chew up their food and swallow it in a semi-solid form; whilst tobacco wash and kerosine emulsions, or resin compounds are of very little use against these, but will kill aphid and scale insects and other sucking insects. Moreover, it is practically valueless to apply Bordeaux mixture to peach trees when the leaves are full of blistering curl leaf fungus, or when your apples or apricots show scabs upon the fruits; but if applied when the peach, apricot, or apple trees are bursting into bloom these fungus parasites are checked or destroyed, and the foliage and fruit kept reasonably clean.

Mr. S. McIntosh submitted that one reason for the non-success of the average farm garden was the evident belief of the farmer that it was cheaper to allow the stock to do the pruning than to use the seccateurs in the proper way.

If only farmers would give to their gardens similar attention to that which they gave to their other farming operations they would be in the happy position of being able to supply all their own requirements in the way of fruit.

Mr. Quinn, in answer to Mr. McIntosh, said he would grow walnuts in selected parts of the South-East, which were admirably suited to the growth and fruition of the trees.

TREATMENT OF SOILS.

The Assistant Director of Agriculture (Mr. Richardson) inaugurated the evening session with an eminently practical dissertation on "The Treatment of Soils." In the South-East, he said, there were probably more varieties of soil than in any other parts of the State. The object of all systems of cultivation was to try and make the most of the land. People used to believe that if a soil were rich in phosphoric acid, nitrogen, and potash it must necessarily be exceedingly fertile; but that was a fallacy, for such a view entirely disregarded the physical condition of the soil, which was quite as important as the chemical condition. Dealing with chemical and physical characteristics of the soil he remarked that it was essential, for the fertility of the soil, that moisture must be readily available, so that it could be fed into the living tissues of the plant. The soil must be kept in a good capillary condition. That could be achieved by running a cultivator through it when the crust was forming on top. By this means a mulch was obtained which prevented the moisture from rising above the zone where the roots were. Another point to be considered was the biological condition of the soil, which was co-ordinate with and equal in importance to the other two. Soil was distinguished from rock dust in that it possessed teeming millions of these microscopic organisms essential for plant life, whereas in rock dust that condition was absent. The bacteria of the soil performed work of incalculable value to the farmer, and the trend of modern science seemed to show that the bacteria were really responsible for the preparation of the available plant food of the soil. One illustration of their work might be seen in the process of nitrification, which went on vigorously in well-prepared South Australian soils. The problem was not to add bacteria to the soil, but to stimulate those already in the soil in such a way that they would do the most efficient work. If the farmer introduced organic matter into the soil, and thoroughly tilled it, he would give the conditions necessary for the most efficient working of the bacteria. Organic matter was one of the most desirable things a farmer could put into his soil. Any treatment of the land must aim at producing the maximum amount of produce and profit. They were liable to be guided to some extent by the experience of settlers in the Northern districts. There the practice generally consisted of alternating crops and fallow, and it had proved profitable. The South-East, however, was essentially different in its physical and climatic conditions to the dry Northern Areas. One of the most seriou

objections to the policy pursued in the North was that it necessitated the land remaining useless for the year—and in some cases the two years—in which it was under fallow. Of course, from the point of view of moisture conservation, it was imperative in certain parts to have fallow. Where they had a heavy rainfall, as in some portions of the South-East, though, the arguments in favor of moisture conservation did not hold good. When the land in the North was not fallow, it was nearly always under wheat, and in following the system the farmers were undoubtedly rapidly depleting their soil fertility. The time was fast approaching when the producers would have to pursue a different method. At present they were taking several important elements out of the land and putting one only mineral—namely, phosphoric acid—back, and no organic matter; indeed, the wheat stubble, which contained a large proportion of organic matter, was invariably burnt, since experience proved that in most districts the stubble took too long to decay. What they wanted in the South-East was to endeavor to frame a system of soil treatment which, instead of depleting the natural soil fertility, would conserve, and, if possible, increase it. (Applause.) They might say that it was impossible; but it had been done in other countries, so why could it not be done in the South-East? That part of the State differed materially from other portions of South Australia, because for every thousand acres of cereals grown in the North there were only six acres of other crops; but in the South-East for every thousand acres of cereals there were 950 acres of other crops, so that there was an infinitely greater variety of produce here. The only way to increase the fertility of the soil was the adoption of a well-conceived rotation of crops. A suitable two-course rotation in some parts of the South-East would be an alternation of legumes and cereal crops, e.g., peas followed by wheat. A good three-course rotation would be root crop, legumes, cereals. The Norfolk four-course rotation—turnips, barley, clover, and wheat—was hardly suitable for the South-East, but it was an ideal rotation, and the spirit could be preserved with advantage to the producers. They were not in a position at present to say just what was the best succession for the South-East, but they hoped to be able to do so in the course of a few years as the result of experiments now being carried out. (Applause.)

FARM COMPETITIONS.

Mr. C. H. Towns (Nhill) read a paper on "Farm Competitions." He said the Nhill Agricultural Society had conducted farm competitions annually since 1900, with splendid results to the farming community in the district. The value of such engagements could not be rated too high. Prizes were offered "For the best exhibited three-fourths of a farmer's wheat crop on fallowed land only" (not less than 100 acres), "For the best worked and managed farm of 640 acres or over," "For the best worked and managed farm of over 100 acres and not exceeding 640 acres," "For the best 100 acres

growing crop limited to crops grown on mallee land," "For the best fallowed land not less than 100 acres." The conditions governing the contests were—The competition shall be open to all farmers farming land within a radius not exceeding 25 miles from Nhill; competitors in sections Nos. 2 and 3 must bring the whole of the land of their farms under the inspection of the judge or judges, but not necessarily rented lands; competitors will be requested to accompany the judges during the inspection of their farms, and to answer any questions bearing on the management thereof which may be put to them by the judges. In deciding the merits of the respective farms inspected by the judges they will be judged as follows, by points:—Large farms.—(a) The best system of cropping, including cultivation, methods, rotation, and manures, 25 points; (b) Cleanest and best crops, including oats, 20; (c) The fallow in best order, area to be considered, 20; (d) The best quality and serviceable classes of stock kept on the farm—horses 20 points, sheep 20, cattle, pigs, and poultry 5, 45; (e) The most complete equipment and class of implements and machinery, 20; (f) The best system of boundary and sub-divisional fencing, including gates and sheep yards, 15; (g) The best kept orchard and vegetable garden, 10; (h) The best arranged system of water storage, points to be given for number of dams and windmills, capacity, location for catchment, accessibility to stock and ease of watering, 45; (i) Best arranged dwellings and outbuildings, 2; (j) Best reserve of fodder of any kind, 15; (k) Best efforts in direction of tree-planting, 5; (l) Farm and stock insurance, 10; total, 250 points. The points were reduced for smaller farms. The farmers were not taxed to provide the prizes, which were contributed to by all classes; for example, last year the storekeepers of Nhill gave £70. He strongly urged the agricultural societies of South Australia to emulate the example of the Nhill organization, and was convinced that the contests would be most beneficial.

THE TREATMENT OF THE HORSE.

"The horse and his ailments" was the text of an address by the Government Bacteriologist (Veterinary-Surgeon Desmond), who dealt with the troubles to which "man's best friend" was liable, "from his head to his heels," and the common methods of treatment. He lucidly described the nature of eye and dental ailments, and the wrong and the right way of treating these complaints, as well as lampas, strangles, and influenza. In connection with the removal of obstacles from the eye it was advisable to first inject three of four drops of a 5 per cent. solution of cocaine which, after a few minutes, would render the eye insensible to pain when the piece of chaff or other foreign substance should be taken out with the aid of a soft damp cloth. In the event of the eye and its surroundings being much inflamed a bandage should be placed over both eyes—a hole for the sound eye having previously been cut out of the material—and kept damp with applications of a mixture made up of 1oz. of laudanum to a pint of cold water. On no account should lotions

be applied to the eye direct. In unmistakable terms the speaker emphasised the cruelty of some of the measures adopted by "teeth-crackers." After having carefully described the anatomy of the horse's teeth, he explained that when the edges of the teeth were sharp, all that was necessary was to file them down with an ordinary fine rasp. It was highly reprehensible to break the teeth forcibly with powerful instruments, as often when this was done the teeth were smashed obliquely and had to be removed altogether. Dealing with the tongue of the horse, Mr. Desmond said it was frequently injured through the barbarous practice of placing a half-hitch of the halter over the tongue and around the lower jaw. Should the animal, when fastened in this manner suddenly pull back, there was a great danger of the front portion of the tongue being crushed off, and the lower jaw seriously injured.

Among the purely imaginary diseases of the horse lampas had always been a prime favorite, and had been responsible for some of the cruellest treatment. Young horses alone were supposed to be subject to the "complaint," as they did not finish teething until the fifth year. During the cutting of the molars a swelling was generally apparent in the bars behind the upper incisor teeth. While this condition existed the horse should be fed on soft food, and upon the animal reaching maturity the trouble would completely disappear. A disease in young horses closely allied to distemper in the dog was strangles. The animals, as a rule, were affected only once in their lifetime. When the trouble occurred in a mild form, provided that the horses had suitable shelter and an abundance of green feed, no special treatment was called for. In bad seasons, however, when feed and water were scarce, and the disease assumed a malignant form, the patients should be placed in well-ventilated sheds, where there was plenty of straw bedding, and fed on green feed. Should this not be obtainable, the horses should be supplied with boiled wheat or barley and bran mashes, and as much clean cold water as they desired. When the swelling appeared in the throat, under the lower jaw, the owner should apply a fly blister, and as soon as the pustule became doughy to the touch, indicating the presence of pus, he should make an opening in the centre of the swelling to allow the matter to exude. The wound should be well washed morning and night with hot water and washing soda. In the early stages influenza in the horse was often mistaken for strangles, but, generally, the constitutional disturbance was greater in the former. As a rule, in influenza the glands in the back portion of the throat were enlarged and painful to any pressure. The throat should be kept warm by means of an eight-tailed bandage, and dressed daily with a mild liniment. The additional treatment advised was practically the same as that followed in connection with strangles. Bleeding and purging could not be too strongly deprecated. Owing to the soreness of the throat, medicines should not be administered by the mouth, as there was a likelihood of them entering the windpipe and finally lodging in the lungs and producing pneumonia.

In all diseases of the horse the first object was to relieve pain, and for this purpose the most rational form of treatment was the administration of chlorodyne or laudanum. The usual dose of chlorodyne was a tablespoonful, and of laudanum two tablespoonfuls, both to be given in a pint of cold water, and repeated every four hours until the animal became free from pain. The stomach of an adult horse had a capacity of about 4galls., and digestion took place best when the stomach was three parts full. This proved that the horse should have small feeds at frequent intervals. A fairly common complaint of the horse was colic, which in the majority of cases was caused by unsuitable feed and a restricted supply of water. It had been demonstrated that when horses had a constant supply of water in front of them colics were of rare occurrence. When a horse knew that he could get water at will he invariably consumed small quantities at a time, but when the supply was irregular he often gorged himself. It was a wise plan to allow horses as much water as they could drink prior to feeding. Colic could be easily distinguished from inflammation of the bowels, as in the former trouble the animal had short intervals of freedom from pain, whereas in the latter the pain was continuous, and the horse was usually covered with perspiration. It should always be borne in mind that nature was the greatest doctor, and that it was the duty of owners of stock to assist it whenever possible. Horses suffering from colic should be allowed their freedom, so that they could roll about on the ground, which was nature's method of helping in the removal of the obstruction in the bowels. The animal should not be walked about or trotted. To alleviate the pain administer chlorodyne or laudanum in the proportions referred to.

In dealing with the course of treatment to be followed when a horse was affected with sand Mr. Desmond uttered some scathing comments concerning the practice of administering linseed or paint oil. That, he said, would be better mixed with white or red lead and applied to the farmers' vehicles, machinery, and fences. Hundreds of horses had been killed in South Australia by the administration of linseed oil which was prepared primarily for using with paint, and contained a considerable quantity of dryers, extracted from different gums belonging to the turpentine family. The accumulation of sand in the intestines was brought about through the horse pulling up the herbage by the roots and eating it with the sand attached. The sand which passed through the stomach was washed through the small intestines with the water supply, and accumulated in the water bag and the large intestines. The proper treatment was to feed the horse on pollard-gruel—that was, pollard well boiled and made into a thick gruel. This should be mixed with a little chaff and bran, and its effect would be to adhere to the sand and carry it gradually away. Should a horse with sand show signs of colicky pains, it was advisable to give it chlorodyne or laudanum as indicated. In the event of the patient declining to partake of the gruel, the mixture should be

frequently renewed (otherwise it would become sour) until the animal changed its mind. It was worth remembering that a horse would live for weeks without feed or water, and that there was not much danger during the progress of this treatment of the animal starving. When horses ate a large quantity of wheat they should be drenched slowly with 4ozs. of common washing soda dissolved in, say, a quart of water. That, if administered sufficiently early, would prevent the grain from being digested, and thus avert any serious consequences.

GENERAL BUSINESS.

The remainder of the evening was devoted to the discussion of general topics.

Mr. Sassanowsky (Mount Gambier) said his Branch had carried a resolution referring to the advisableness of having a representative of the South-Eastern Branches on the Advisory Board of Agriculture, and had expressed the hope that the Conference would send on a recommendation to that effect. He had pleasure in moving accordingly. The conditions in the South-East were so different from what they were in the North that direct representation was essential and thoroughly justified. Mr. J. G. Forster (Naracoorte) seconded. Mr. Sandford pointed out that the board would be glad to welcome a representative of the South-East, but he believed that on a previous occasion when a similar proposal to that under consideration had been brought forward the Minister had been unable to see his way to increase the number of the members, having in view that each district would expect to be represented. Mr. Summers explained that industries and not districts were represented on the board. There were three representatives of the farming, three of the dairying, two of the fruit-growing, and one each of the wine-growing and stock industries. In addition, they had the Chief Inspector of Stock, Professor Perkins, and Professor Angus as advisory members. If a direct representative of the South-East was warranted, surely there were other districts, including the West Coast and Loxton, which had equally strong claims.

The motion was carried.

Mr. A. Wilson moved—"That it be a recommendation to the Government that Mr. Colebatch should be allowed the assistance of the diploma students in connection with the conduct of experimental work." Mr. E. W. Milne (Tatiara) seconded.

Mr. T. Stanton (Tatiara) moved an amendment—"That the matter be referred to the general Conference to be held in Adelaide in September." The subject was really too big to be disposed of at that meeting. Mr. R. Reschke (Tatiara) seconded. The amendment was negatived and the motion was carried.

THE NEXT CONFERENCE.

At the instance of Mr. J. C. Ruwoldt (Mount Gambier), seconded by Mr. M. J. O'Shea (Tatiara), it was decided to hold the next Conference at Naracoorte.

THE WHEAT MARKET.

In the March *Journal* an extract from an English paper published a month previously suggested a probable weakening of the London market, and early in April the prediction began to be fulfilled, chiefly, however, as the result of the opening of the Azov ports, where there was a considerable quantity of wheat available for export. In sympathy with the London market the price in Adelaide dropped suddenly in the middle of April from 4s. 0½d. or 4s. 1½d. to 3s. 9½d. or 3s. 10½d., the quotations of merchants varying to the extent of 1d. The price during the early days of May fell to 3s. 7½d. or 2s. 8d., and it may be said that no further serious fall is anticipated. The following extract from *Broomhill's Corn Trade News* is reassuring in that respect:—"It now remains to be seen how the present inveterate indifference of operators will be affected by the customary crop scares which usually come round with the spring season, upon which we have now entered. These crop scares come round every year, for in the course of nature there are bound to be some losses between seed-time and harvest; the question is, whether the losses will be widespread and material, or whether they will prove to be merely local. In the present temper of the trade it seems likely that the minor scares will pass unheeded, for consumers will be conscious that farmers, in many lands, are carrying good stocks of old wheat which will go far towards making up merely local losses. An instance in point is beginning to develop in the winter wheat belt of the United States, where serious injury has occurred from winter-kill, but as the acreage planted last autumn exceeded that harvested last summer by 5,000,000 acres, and, moreover, as farmers' reserves of old wheat in several of the winter wheat States are reported to be above the normal, the effect upon prices so far has been insignificant. With a five million acres increase, there is plenty of margin for a loss by winter-kill, and should the crop on the remaining area do fairly well there might be a larger total output than in the year 1909, and with larger reserves there might easily be freer marketings next July-August, for it will be remembered that last July-August farmers' reserves were reduced to the point of exhaustion. On the other hand, there is a growing conviction that the day of low prices is gone by for ever, or, at any rate, for many years to come. After a careful investigation we believe we are correct in stating that the wholesale price of every article of commerce—foodstuffs, oils, textiles, metals, and even agricultural land—has enormously increased in price during the last 10 or a dozen years (the only probable exception being hemp, manila, and silk), and a curious feature about the case is that the rise does not seem to be the direct effect of scarcity, for, as in the instance of wheat already quoted, the supply, in commercial channels, of most articles appears to be more abundant than in former years of cheapness. Under these circumstances it is not surprising, perhaps, that wheat should continue to augment in value from year to year, even though slowly and with occasional set-backs. As to the prospects of the immediate future, we would repeat what we have frequently said before in these weekly reviews, that with only one big grower possessing a large exportable surplus there seems to be but little chance of a slump in prices, more particularly so seeing that the reserves in merchants' hands in the principal importing countries are quite moderate and even small in a few instances. From the Argentine this season there is but little likelihood of importers receiving much relief, for every advice we receive by cable and mail confirms us in the belief that the result of the late harvest is fully as bad as the worst apprehensions expressed at harvest time. Russia probably holds the key of the position, for the evidence that there remains a good-sized exportable surplus is fairly convincing, although we admit the authorities are not quite unanimous; still with a stock of over two millions in the ports and substantial reserves, at any rate, in the south-eastern region, tributary to Rostoff, it would be idle not to anticipate liberal shipments in the near future should a fair price be obtainable and should there be no serious set-back to the growing crop, nor an abnormally adverse spring seeding season."

Date.	LONDON (Previous Day).		ADELAIDE. Per Bushel.	MELBOURNE. Per Bushel.	SYDNEY. Per Bushel.
	Feb. 4/10½	Jan. 4/11½ (sailer) ..			
April 6	..	..	4/0½ to 4/1½	4/1 to 4/1½	4/1 to 4/1½ (s.)
7	..	..	4/- to 4/0½	Do. ..	Do. ..
8	..	..	..	Do. ..	Do. ..
9	..	..	..	Do. ..	Do. ..
11	..	..	..	Do. ..	Do. ..
12	Jan. 4/11½ ..	..	..	..	4/0½ to 4/1½ (s.)
13	Dull ..	..	4/-	Do. ..	Do. ..
14	Steady ..	..	4/-	Do. ..	4/0½ (b.) ; 4/1 to 4/1½ (s.)
15	Dull ..	..	3/11½	..	..
16	Do. ..	..	3/11 to 3/11½	..	..
18	..	..	Do. ..	..	3/11½ to 4/- (b.) ; 4/1 (s.)
19	Dull ..	..	3/10½ ..	4/-	3/11 to 3/11½ (b.) ; 4/0½ (s.)
20	Very dull ..	..	..	Do. ..	4/0½ (s.)
21	Dull ..	..	..	Do. ..	..
22	Steadier ..	..	..	Do. ..	..
23	Quiet ..	..	..	Do. ..	..
25	..	..	3/9½ to 3/10½	..	3/10½ to 3/11 (b.) ; 4/- (s.)
26	Jan. 4/8½ : Feb. 4/8½	..	Do. ..	Do. ..	..
27	4/8½ (off coast) ..	..	Do. ..	Do. ..	3/10½ to 4/- (b.) ; 4/0½ to 4/1 (s.)
28	Very weak ..	..	3/9½ to 3/10	3/11½ to 4/-	3/10½ to 4/- (b.) ; 4/0½ (s.)
29	4/7½ (off coast) ..	..	Do. ..	Do. ..	3/10 to 3/10½ (b.) ; 4/- (s.)
30	4/6½ ..	..	3/8½ to 3/9	3/11 (s.) ..	3/9½ to 3/10 (b.) ; 3/11 (s.)
May 2	..	..	3/8 to 3/9	3/10½ (s.) ..	..
3	..	..	3/7½ to 3/8	3/10 alongside ..	..
4	May-June, 4/13 (sailer) ..	..	Do. ..	3/9½ to 3/10	..
5	Very firm ..	..	Do. ..	Do. ..	..
6	Dull ..	..	Do. ..	3/10 ..	3/9
7	Do. ..	..	Do. ..	..	..

STEAMER FREIGHTS.—Parcels, Port Adelaide to London or Liverpool, 22s. 6d. per ton (7½d. per bushel); Port Adelaide to South Africa, 20s. per ton (6½d. per bushel); Port Adelaide to Melbourne, 8s. a ton (2½d. per bushel); Port Adelaide to Sydney, 10s. 6d. per ton (3½d. per bushel).
 SAUER FREIGHTS.—Australian ports to United Kingdom—Continent, 20s. to 21s. per ton (6½ to 6½d. per bushel); South Australian to South Africa, 18s. to 19s. per ton (5½d. to 6½d. per bushel).

RAINFALL TABLE.

The following table shows the rainfall for April, 1910, at the undermentioned stations, also the average total rainfall for the first four months in the year, and the total for the four months of 1910 and 1909 respectively:—

Station.	For April, 1910.	Avg. to end April	To end April, 1910.	To end April, 1909.	Station.	For April, 1910.	Avg. to end April	To end April, 1910.	To end April, 1909.
Adelaide	0.06	4.37	4.24	4.88	Hamley Bridge	0.11	4.04	5.22	3.37
Hawker	0.07	2.64	3.99	1.85	Kapunda	0.10	4.36	5.56	4.79
Cradock	0.23	2.71	3.96	1.31	Freeling	0.42	4.05	5.82	3.66
Wilson	0.11	2.82	4.82	1.64	Stockwell	0.08	4.42	4.57	3.58
Gordon	—	5.76	2.78	1.09	Nuriootpa ...	0.39	4.52	4.94	3.78
Quorn	0.17	2.85	2.76	1.40	Angaston ...	0.17	4.43	5.43	5.19
Port Augusta.	0.03	2.64	2.58	1.50	Tanunda ...	0.18	4.69	4.14	5.29
Port Germein	—	3.21	3.84	2.88	Lyndoch ...	0.17	4.64	3.96	4.87
Port Pirie ...	0.01	3.29	5.26	1.66	Mallala ...	0.07	4.02	4.19	3.34
Crystal Brook	0.03	3.43	4.41	3.19	Roseworthy	0.19	4.07	6.06	4.14
Pt. Broughton	0.03	3.41	3.24	2.84	Gawler	0.14	4.28	4.47	4.75
Bute	—	3.41	3.40	3.31	Smithfield ...	0.07	3.80	5.34	4.19
Hammond ..	0.06	2.88	4.11	1.53	Two Wells ...	0.05	3.94	3.58	3.16
Bruce	—	2.17	2.97	0.52	Virginia ...	0.02	4.03	4.20	4.27
Wilmington.	0.31	3.68	5.85	2.26	Salisbury ...	0.07	4.25	4.87	4.13
Melrose	0.10	4.98	9.52	2.99	Teatree Gully	0.23	6.27	4.79	7.40
Booleroo Cntr	0.05	3.47	4.97	1.71	Magill	0.22	5.56	3.82	7.08
Wirrabara ...	0.30	3.91	7.25	3.23	Mitcham ...	0.16	4.89	3.91	5.44
Appila	0.76	3.56	7.86	2.80	Crafers ...	0.80	8.80	8.19	12.69
Laura	0.16	3.83	7.26	3.68	Clarendon ...	0.51	6.86	4.69	8.86
Caltowie	0.39	3.70	5.48	2.53	Morphett Vale	0.20	5.18	3.77	6.47
Jamestown .	0.10	3.65	3.42	2.13	Noarlunga ...	0.15	4.38	2.80	4.74
Gladstone ..	0.26	3.51	4.71	2.38	Willunga ...	0.19	4.92	4.56	6.60
Georgetown ..	0.17	4.06	3.57	2.61	Aldinga ...	0.19	4.64	2.82	4.57
Narridy	0.04	3.88	3.27	2.04	Normanville.	0.10	4.06	3.93	4.37
Redhill	0.04	3.57	4.25	2.79	Yankalilla ...	0.21	4.71	6.40	4.14
Koolunga ...	0.24	3.61	4.33	2.22	Eudunda ...	0.01	3.59	8.14	2.51
Carrieton....	0.08	2.71	7.07	1.12	Sutherlands ...	—	—	4.73	0.85
Eurelia	0.18	2.95	5.59	1.05	Truro ...	0.10	4.09	4.40	3.83
Johnsbury ..	0.13	2.14	4.85	0.88	Palmer ...	0.26	—	5.42	3.30
Orroroo ...	0.05	3.47	4.96	1.09	Mt Pleasant.	0.46	5.16	4.88	5.56
Black Rock..	0.07	3.10	5.80	0.94	Blumberg ...	0.40	5.78	5.22	7.00
Petersburg ..	—	3.22	4.07	1.64	Gumeracha ...	0.38	5.99	5.54	9.20
Yongala ...	—	3.14	4.48	1.30	Lobethal ...	0.46	6.27	5.56	9.81
Terowie ...	—	3.17	7.89	1.46	Woodside ...	0.58	5.57	6.86	8.36
Yarcowie....	—	3.19	6.80	1.63	Hahndorf ...	0.96	6.29	7.92	7.29
Hallett	—	3.45	4.37	1.81	Nairne ...	0.80	5.69	8.92	8.13
Mount Bryan	—	3.01	5.27	1.46	Mt. Barker ...	0.72	5.70	8.49	8.18
Burra	0.11	3.72	6.51	3.34	Echunga ...	1.16	6.15	9.80	8.62
Snowtown ...	—	3.46	4.05	3.33	Macclesfield ...	0.87	5.74	9.83	8.97
Brinkworth..	0.43	3.15	5.06	1.82	Meadows ...	0.80	7.07	9.20	10.68
Blyth.....	—	3.75	3.59	3.13	Strathalbyn ...	0.35	3.93	7.35	5.27
Clare	0.30	5.00	6.68	3.88	Callington ...	0.21	3.70	5.69	3.41
Mintaro Cnrtl.	0.36	4.14	6.72	3.46	Langh'rme's B	0.14	3.56	4.62	3.24
Watervale...	0.25	5.54	7.06	5.37	Milang ...	0.10	3.83	3.24	3.45
Auburn ...	0.38	5.08	7.39	5.52	Wallaroo ...	0.05	3.23	2.02	3.27
Manoora ...	0.29	3.75	6.38	2.78	Kadina ...	—	3.71	1.91	3.49
Hoyleton ...	—	4.27	3.67	2.97	Moonta ...	—	3.56	1.79	4.67
Balaklava ...	—	3.90	3.93	2.57	Green's Plns.	—	3.26	2.34	3.39
Pt. Wakefield	—	3.57	3.07	1.70	Maitland ...	0.01	4.05	2.42	4.23
Saddleworth	0.22	4.53	6.39	2.68	Ardrossan ...	0.06	3.08	2.10	2.24
Marrabel ...	0.06	4.18	6.06	3.65	Port Victoria	0.14	3.18	1.87	3.16
Riverton... .	0.50	4.46	7.68	4.44	Curramulka ...	0.22	3.67	3.00	3.53
Tarlee	0.41	4.06	6.29	3.78	Minlaton ...	0.10	3.42	2.92	3.15
Stockport ...	0.26	3.86	4.93	2.64	Stansbury ...	0.09	3.45	3.35	3.04

RAINFALL TABLE—*continued.*

Station.	For April, 1910.	Av'ge. to end April.	To end April, 1910.	To end April, 1909.	Station.	For April, 1910.	Av'ge. to end April.	To end April, 1910.	To end April, 1909.
Warooka....	0.28	3.02	2.20	3.58	Bordertown .	0.31	4.06	4.26	3.93
Yorketown .	0.17	3.27	3.42	3.50	Wolseley....	0.27	3.73	4.69	3.75
Edithburgh..	0.25	3.46	3.92	4.50	Frances.....	0.60	3.95	4.87	3.80
Fowler's Bay.	—	2.44	0.28	2.03	Naracoorte .	0.73	4.41	5.70	4.84
Streaky Bay.	—	2.85	0.12	2.99	Lucindale ...	0.86	4.34	6.16	5.04
Port Elliston.	0.07	2.63	0.41	3.14	Penola	0.89	5.24	6.81	6.00
Port Lincoln.	0.21	3.64	1.01	4.20	Millicent	1.13	5.88	4.91	7.26
Cowell	—	3.15	3.56	2.09	Mt. Gambier.	1.39	6.54	6.09	8.92
Queenscliffe .	0.30	3.24	4.76	3.30	Wellington ..	0.03	3.75	5.25	3.83
Port Elliot ..	0.28	4.35	3.99	3.94	Murray Brdge	0.01	3.61	6.74	3.25
Goolwa	0.18	3.85	3.64	4.80	Mannum ...	0.09	3.11	5.81	2.60
Meningie....	0.46	3.90	3.70	4.93	Morgan	0.02	2.36	3.39	1.10
Kingston....	0.61	4.58	4.38	5.59	Overland Crnr	—	3.07	6.06	1.11
Robe	1.06	4.46	4.68	5.05	Renmark....	0.01	2.69	4.69	1.47
Beachport... .	1.53	5.21	3.93	6.92	Lameroo ...	0.01	—	4.16	3.56
Coonalpyn ..	0.04	3.76	4.21	4.56					

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,300 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

The Manager of the Produce Export Department reports on May 6th—

EGGS.

The April market opened up with good demand at 1s. 4d. per dozen for guaranteed consignments, but about the middle of the month, owing to the favorable weather conditions and the influx of chilled and pickled eggs, the increase in the number of eggs coming forward had the effect of easing the market to the extent of 1d. per dozen, when there was good demand at 1s. 3d. per dozen for guaranteed lines. On the 19th April the market dropped 1d., and there was good demand both for local and inter-State trade at that figure. On the 29th the market rose 1½d., and at 1s. 3½d. ready sales were effected. During the month there has been strong demand for circle graded eggs, which are established on the inter-State markets.

BUTTER.

The springlike weather experienced during the month of April has resulted in a very large quantity of cream being received at the factory, exceeding the quantity received last year for the same period to a considerable extent. The quality of the butter produced has been up to standard, the quantity in the higher grades being well maintained. Prices have fluctuated slightly during the month the present prices being—Superfine, 1s. 2½d. per pound; pure creamery, 1s. 1d. per pound.

Messrs. A. W. Sandford & Co. report the following quotations on May 1st:—

FLOUR.—City brands, £9 10s.; country, £9 5s. per ton of 2,000lbs.

BRAN.—1s. 3d. per bushel of 20lbs.

POLLARD.—1s. 3d. per bushel of 20lbs.

OATS.—Local Algerians, 2s. 0½d. to 2s. 1d. per bushel of 40lbs.

BARLEY.—Cape, feed, 2s. 5d. to 2s. 6d. per bushel of 50lbs.

CHAFF.—£3 10s. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £4 7s. 6d. to £4 12s. 6d., on trucks, Adelaide or Port, per ton of 2,240lbs.

ONIONS.—Locals, £3 to £3 10s.; Gambiers, £3 2s. 6d. to £3 7s. 6d., on trucks, Adelaide or Port, per ton of 2,240lbs.

BUTTER.—Factory and best creamery, fresh in prints, 1s. 1d. to 1s. 2½d.; second grade factories and creameries, 10½d. to 11½d.; choice separators, dairies, 11d. to 1s. 0½d. medium creamery, separators, and dairies, 9d. to 10d.; stores and collectors, 7½d. to 9d. per lb.

CHEESE.—Factory makes, 5½d. to 6½d. per lb.

BACON.—Factory-cured sides, 8d. to 8½d. per lb.

HAMS.—In calico, 9d. to 9½d. per lb.

EGGS.—Loose, 1s. 3½d. per dozen.

LARD.—In skins, 6½d.; bulk, 6d.

HONEY.—Prime clear extracted, 2½d. per lb.; dark and candied, 2d.; beeswax, 1s. 1½d.

ALMONDS.—(Searce) soft shells, Brandis, 7d.; mixed soft shells, 6½d.; kernels, 1s. 3d. per lb.

LIVE POULTRY.—Good table roosters, 2s. 3d. to 2s. 9d. each; light cockerels, 1s. 3d. to 1s. 9d.; hens, 1s. 2d. to 1s. 8d.; ducks, 1s. 10d. to 2s. 6d.; geese, 3s. to 4s.; pigeons, 6d. to 7d.; turkeys, from 6½d. to 9d. per lb., live weight, for fair to good table sorts.

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		May.	June.			May.	June.
Amyton	885	—	—	Merghiny	*	5	2
Angaston	*	21	18	Millificent	*	10	14
Appila-Yarrowie	*	—	—	Miltalie	†	21	18
Arden Vale & Wyacca	885	—	—	Minlaton	901	28	25
Arthurton	*	—	—	Mitchell	905	21	25
Balaklava	896	14	11	Moonta	*	—	—
Beetaloo Valley	*	—	—	Morchart	888	—	—
Belalie North	†	21	18	Morgan	*	—	—
Bowhill	*	—	—	Morphett Vale	*	—	—
Brinkworth	889	24	21	Mount Bryan	*	—	—
Bute	*	—	—	Mount Bryan East	*	7	4
Butler	*	—	—	Mount Gambier	919	—	—
Caltowie	*	23	20	Mount Pleasant	†	13	10
Carrieton	886	19	23	Mount Remarkable	†	19	23
Cherry Gardens	913	24	21	Mundoora	†	—	—
Clare	897	20	17	Murray Bridge	909	—	—
Clarendon	913	23	20	Nantawarra	898	18	22
Colton	903	21	25	Naracoorte	*	14	11
Coomooroo	*	23	—	Narryd	*	21	—
Coonalpyn	*	—	—	Northfield	899	24	21
Craddock	*	21	18	Orroroo	*	—	—
Crystal Brook	*	—	—	Parrakie	912	7	4
Cummins	*	21	18	Paskerville	*	21	18
Davenport	886	—	—	Penola	†	14	11
Dawson	887	—	—	Penong	905	14	11
Dingabledinga	914	13	16	Petina	906	21	18
Dowlingville	*	—	—	Pine Forest	902	24	21
Forest Range	*	19	16	Port Broughton	*	20	17
Forster	908	14	11	Port Elliot	915	21	18
Fowler Bay	*	21	18	Port Germlein	890	—	—
Frances	*	20	17	Port Pirie	890-2	7	4
Freeling	*	—	—	Quorn	888	21	—
Gawler River	898	—	—	Redhill	894	21	18
Georgetown	890	21	25	Renmark	*	—	—
Geranium	*	28	25	Rhine Villa	912	—	—
Golden Grove	*	19	23	Riverton	*	21	18
Goode	*	—	—	Saddleworth	*	20	17
Green Patch	*	23	20	Salisbury	899	3	7
Gumeracha	914	23	20	Shannon	906	—	—
Hartley	914	21	18	Sherlock	*	—	—
Hawker	*	20	17	Smoky Bay	*	—	—
Hookina	887	—	—	Stansbury	*	—	—
Inkerman	*	19	23	Stockport	*	—	—
Johnsburg	†	21	18	Strathalbyn	*	16	20
Kadina	900	19	23	Sutherlands	912	21	—
Kalangadoo	916-18	14	11	Tatiara	*	—	—
Kanmantoo	*	20	17	Uraidla and Summert'n	915	2	6
Keith	918	—	—	Utera Plains	907	21	18
Kingscote	*	3	7	Virginia	*	—	—
Kingston	*	28	25	Waikerie	*	—	—
Koolunga	*	24	21	Watervale	*	—	—
Koppio	904-5	—	—	Wepowie	889	—	—
Kybybolite	*	19	16	Whyte-Yarcowie	895	21	25
Lameroo	*	—	—	Wild Horse Plains	*	—	—
Lipson	*	—	—	Willunga	*	7	4
Longwood	915	18	22	Wilkawatt	†	—	—
Lucindale	918	—	25	Wilmington	†	19	23
Lyndoch	†	19	23	Wirrabara	889	—	—
Maitland	*	7	4	Woodside	*	—	—
Mallala	*	2	6	Yallunda	908	—	—
Mannum	†	28	25	Yongala Vale	896	21	18
Meadows	*	—	—	Yorketown	*	14	11
Meninna	*	—	—				

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD)

Amyton, March 22.

(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT.—Messrs. O'Donoghue (chair), Gum, T. and P. Ward, Brown, Bristow, Crisp, Thomas (Hon. Sec.), and one visitor.

DRILLING AND BROADCASTING FOR WHEAT.—Mr. Crisp read a paper on this subject. While he was of opinion that the use of the drill was the best method of seeding, in spite of the fact that a less area could be sown in a day than by broadcasting, he thought that thorough tests as to the resultant yields had not been made. Plots of the same size should be sown by the two methods with the same quantity of seed, and then be harvested separately, before one could accurately compare the yields. If the land was worked to a fine tilth, he continued, quite 5 per cent. of the grain, if broadcasted, remained uncovered and was lost, whereas with the drill the seed was put in at an even depth and properly covered. He thought there was danger, however, of drilling in too deeply. Drilled wheat crops stood up considerably better than those that were broadcasted. The drilled crop could also be harrowed with less damage to the growing plants, and water from a light shower of rain would run along between the rows and be more evenly distributed. He thought that 50lbs. of seed per acre drilled in would return as much as 60lbs. broadcasted, and this saving alone would amount to a good deal in a few years. Members were unanimous in the opinion that it was best to drill in the seed with manure, the quantity of the latter depending upon the rainfall. Mr. O'Donoghue said he would never again sow Gluyas wheat without manure, as it stood up much better when grown with the fertiliser. Mr. Gum had harrowed after the drill, but found that this shifted some of the grain from the manure. Mr. Bristow preferred to harrow after the wheat came up. Speaking of the characteristics of Gluyas and Viking wheats, members said that while the former had a tendency to bend over, the latter would break or go over from the root.

Arden Vale and Wyacca, March 21.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. M. Eckert (chair), A. Eckert, Klingberg, O. and P. Hanneman, Greer, Schumann, Rogers, Hantschke, C. and C. F. Pearce (Hon. Sec.), and several visitors.

NOTES ON THE PAST SEASON.—The Hon. Secretary reported that the rainfall for 1909 was 16·64in. Harvest returns—wheat yield for 1909, estimated by members at 9bush. per acre for Yarrah and Wyacca. The area reaped was not as large as usual on account of the lateness of the autumn rains and the excessive rainfall during the winter months. Some patches of fallow land returned over 30bush. per acre, and some of the late crops in the hills which were waterlogged for months, yielded as low as 3bush. per acre. The best returns returns in both hundreds were from Federation wheat. It was said that this popular variety would soon come into general use here on account of its many good qualities. Fertilisers were coming more into use every year, and the returns from the use of manures last year were the most profitable on record.

KILLING WEEDS.—A good discussion took place in regard to the best implement for cleaning dirty land on the stump-jump principle in rough hilly country. The majority of members favored the skim plough in preference to anything on the scarifier principle, and several members strongly recommended the "Jones" skim plough, which is becoming a very popular implement.

WILD DOGS.—A long discussion took place in reference to the wild dog question. The majority of members were of opinion that the suggestion of the Mount Remarkable Branch, to have a sound system of local rating to deal with the question, was a good one; or better still if the Government and local district councils could together devise a workable scheme to keep the pest within bounds.

GARDENING.—The Hon. Secretary reported on his gardening operations during 1909 as follows:—"My pea crop was light, almost a failure, owing to too much winter rain and not enough in the spring. The onion crop was only fair. Nectarines yielded a heavy crop. Peaches very light with very fine fruit. The apricot, quince, grape, and almond crops were very good, the almonds yielding between four and five cornsacks full. My gardening operations for the past three years have been carried out with only the natural rainfall, irrigation being used only for vegetables, tomatoes, cucumbers, and watermelons. I have produced a good crop of pie melons this year, without any rain whatever, by simply sowing a few seeds on the outside of an old chaff heap, and they grew just as well as though they had been getting abundance of rain weekly. Members should not give the whole of their attention to growing wheat and banking money in these prosperous times. It is not wise to neglect the garden, but all should try to do something to beautify the home."

Carrietton, March 26th.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Gleeson (chair), Manning, C. F. and J. F. Fisher, Radford, Ormiston, Bock (Hon. Sec.), and two visitors.

DAIRYING.—The Secretary tabled report of Minister of Agriculture for 1908-9, and read figures dealing with the Government Butter Factory. He considered this factory had been of great advantage to the producers, as it had afforded them the means of checking results from private firms. Considerable discussion on dairying followed. Mr. Radford said that as an industry there was very little to be made out of dairying in this district. If they had to pay wages there would not be much left for the owner, and in his opinion sheep would pay better. The Hon. Secretary said most farmers, like himself, combined wheat-growing with dairying, and found it a good investment. There was, of course, a good deal of labor attached to dairying, but he was satisfied that it paid. Mr. Gleeson said he was one of the first to introduce the separator to the district, and he could not help noticing the great improvement made of late years in these appliances. He would advise all dairymen to use the milk tester to enable them to cull out the unprofitable cows.

Davenport, April 14.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Bothwell (chair), Roberts, Holdsworth, Gosden, Messenger, Hogan, Bice, and Lecky (Hon. Sec.).

FAR NORTHERN CONFERENCE.—Members were in favor of proposal to hold a Conference of Far Northern Branches at Quorn or Orroroo some time in June.

PERCHERON HORSES.—Mr. Bothwell read a paper describing this breed of French horses. Although practically unknown in this part of the world it was very popular in America. The Percheron does not stand as high as the Clydesdale or Suffolk, rarely over 15 hands 2in. high; he has a neat, graceful, head set on a long arched and powerful neck; the back short and well ribbed up; deep broad chest; the legs short, particularly the cannon bone; a medium quantity of hair, but not shaggy; the feet are hard, sound, and free from disease, a point that has much to recommend this breed, as it has become a saying with horsemen, "No foot, no horse," meaning that, however good a horse may be, if the feet are not sound the horse is not of much value. The prevailing color is grey; other colors are occasionally met with, but never such as sorrels, roans, or any two-colored horses. Another good point in breeding from the Percheron is that the stock invariably possess the good points of this breed, which are many, and the bad are eliminated of the other. In using the Percheron sire an ideal farm horse would be the result if suitable mares were used. A horse would be got of about 15 hands 2in. high, compact, short legs, close to the ground, not too much daylight, good hard feet, and legs that would stand any reasonable amount of work, docile, and intelligent. Members wished to know whether any horses of this breed existed in South Australia. [Not that we know of.—Ed.] They thought that from the description given this breed would be a very suitable horse for general farm work,

Dawson, March 26.

(Average annual rainfall, 10½ in.)

PRESENT.—Messrs. Renton (chair), Wilson, Smart, Stigwood, Burden, Quinn, Meyers, and Nottle (Hon. Sec.).

PICKLING WHEAT.—Discussion on pickling seed wheat for the prevention of smut (bunt) took place. Some members who pickled seed last season had a good deal of bunt in the crop, while others who did not pickle at all had clean crops. It was thought that some farmers used the pickling solution too strong, and others too weak. It was stated that some seasons appeared to be more favorable than others to the spread of this disease. Difference of opinion existed as to whether the bunt grew with the wheat, or whether it was caused by heat after rain. [The former explanation is correct. The fungus spore on the seed germinates at about the same time as the grain itself, and the fungus grows with the plant, finally producing the myriads of spores which are seen in the place of the grain.—Ed.] Others present had sown smutty wheat and reaped a clean crop from it. After lengthy discussion members were of opinion that all seed wheat should be pickled. They preferred bluestone to any other pickle, using 1lb. of bluestone to 8bush. of seed. Pickling the wheat on the floor, using a shovel and turning it over three times, and leaving it for a few hours before bagging. If they had large quantities to pickle they preferred to have the cask, as they could get through it a great deal more quickly.

Hookina, March 26.

PRESENT.—Messrs. M. Woods (chair), J., A., W., and J. Henschke, jun., Murphy, L. Woods, F. and S. Stone, Sheridan, Madigan (Hon. Sec.), and three visitors.

SHEEP ON THE FARM.—Mr. F. Stone read the following paper on this subject:—"With high prices ruling for sheep and wool of late years, farmers have been keeping a few sheep. This is very profitable, as a few sheep entail little trouble compared with the profits. The meat supply is a large item on a farm, and by judicious management a small flock of sheep should easily provide this want. The most favored breed in this district is the Merino. The wool from this class of sheep meets with a ready sale, whilst they are also quiet, and do not, as a rule, trouble the fences—a big factor on a farm where they are allowed to graze in paddocks adjoining wheat crops. In winter months sheep can be kept on land which is intended for fallow, and feed which would otherwise be wasted can be turned to profitable account. This also makes fallowing easier, and tends to make a better job than if the land is overgrown with weeds. Later on sheep can be utilised to keep the fallow clean, thus saving much labor. In summer stubble land provides good pasture, especially if a crop has suffered from stormy weather. A good deal of difference of opinion exists as to whether running sheep on growing crops in the early stages is beneficial or detrimental. In clayey land, which is liable to form a crust on top, sheep may be pastured with good results, as they do much to break the hard surface, giving the following rain easy access to the soil. With drilled crops, where the grain is all sown to a regulated depth, the presence of sheep is more beneficial than in those sown broadcast, as the risk of pulling up the plant is considerably reduced. Running sheep on a crop in loose, sandy soil is harmful, as they drag out the plants and make the crop painfully thin. In no case should they be allowed on crops in wet weather, nor when the plants are very young. Sheep need plenty of water, easy of access, during summer months. In this district, with the uncertainty of early rain, lambing should not commence before May. If rain falls earlier, so much the better, as the ewes will be stronger and give plenty of milk, but they will not do this on dry food. May weather is not too hot, and by the time the cold weather sets in the lambs are strong. In a couple of days, if provided with a good mother, a lamb is well able to withstand the cold. Early lambs, although they cut a little more wool, do not show any very marked difference in size by shearing time, whilst the trouble of rearing March lambs is almost double that of those later born. Aged ewes very often rear fine lambs, as they are good mothers, and under moderate conditions can be relied upon to give plenty of milk; however, as they are much more difficult to fatten when old, they should not be kept too long. Young rams are better than old ones. I favor keeping a few sheep rather than stocking the land to its full capacity, with the risk of trouble in times of drought. Although sheep can be managed in conjunction with farming with little trouble, we must not overlook the fact that the more time and care bestowed on a flock the greater will be the profits." In the discussion which followed the general opinion seemed to be that April was the best month for lambing, unless the season was very late, in which case early in May was the best time. The Merino sheep were thought to be the best type to keep, unless freezers were required, in which case the Shropshire cross was recommended. Mr. J. Henschke thought sheep

did more harm than good to the growing crop; they pulled up a lot of wheat if the soil was loose, and did not eat the crop down at all evenly. Mr. Sheridan thought early varieties did better, if eaten off, to make them stool out, and that young crops benefited if sheep were turned in after rain and driven about the paddock. Speaking of fences to protect sheep from wild dogs and dingoes, it was stated that the dogs would get over a fence unless it was very high, and that the latter animals would break it with their teeth if not made strong enough to withstand the attack. Mr. A. Henschke considered that it did not pay a farmer with only a few hundred sheep to class the wool. Skirting was quite sufficient, providing, of course, that the wool from hoggets, ewes, and lambs was kept separate.

Morchart, April 23.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Kitto (chair), Toop, Kupke, Reichstein, Scriven, jun., Jasper, Kirkland, McCallum, J. and J. B. McDougall (Hon. Sec.), and two visitors.

STABLE MANURE.—The following paper, written by Mr. Jas. Scriven, was read by the Hon. Secretary:—In the earlier history of the Northern Areas the land was too rich to admit of farmyard manure to any extent; perhaps the failure has been largely due to ineffective or careless spreading. I have often seen farmyard manure carted into the paddocks, tipped out in dray loads, and left till ploughing time: then the farmer would go out and throw the top of the heap about a little and go on with the ploughing. Under such circumstances is it any wonder that the crop is patchy and most of the wheat on the manured land is blighted, and on the centre of the heaps quite burnt up? I am of opinion that if the manure were carted out, say, in March, while the ground is hard. Carting in dry weather would avoid cutting ruts in the soil and would be better in every way. A load could be made into three heaps, as small heaps can be spread more evenly than large ones, and there is then no danger of the manure being too thick for the warm land of this district. If the farmer has plenty of time to spread it from the dray, that is the best way of all, as the whole business is finished in one operation. As far as I am aware, there is no farmer in our district who uses the manure he has available in anything like a systematic way. What I would suggest is to cart manure on to as large a plot as it would cover and note the effect on the crop, and also note the class of land. If the result is not satisfactory, try to find out what is wrong. If the crop blights, most likely the manure has been too thickly applied, or it may be for want of moisture. I think the results of any of our experiments should be brought before our Bureau meetings to enable them to achieve their object—of being mutually helpful. Members considered that a great deal of good might be done to the soil by the proper use of stable manure.

Quorn, April 23.

(Average annual rainfall, 13½in.)

PRESENT.—Messrs. Thompson (chair), Cook, McColl, Noll, Bury, Brewster, and Patten (Hon. Sec.).

CONFERENCE FOR UPPER NORTH.—Discussion took place on the proposal to hold a Conference of Upper Northern Branches. Members agreed to support the movement, and considered that it would be best to hold the Conference alternately at Orroroo and Quorn, as these were conveniently situated towns in regard to railway, &c. They thought the Branches located near Orroroo should form a committee to arrange the first Conference, and that it would be best to hold it on a Thursday as near full moon as possible.

PICKLING SEED WHEAT.—Mr. Brewster read an extract in which the use of equal parts of salt and bluestone was recommended as a preventive of smut (bunt). He considered the crops on the hills were more subject to the disease than those grown on the plains. Mr. Noll dipped the wheat in a cask, the solution being made with 1lb. of bluestone to 10galls. of water. He took care that all the grain became thoroughly wet, and considered it best to pickle the wheat some time before sowing. Mr. McColl always used a cask, and did not pickle much in advance. From time to time he added bluestone to keep up the strength of the solution. He thought that weather conditions had a good deal to do with the progress of the disease. Pickle should not be made too strong. Mr. Bury considered it best to have seed wheat reaped last, or as late in the season as possible.

Wepowie, April 1.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. J. Crocker (chair), Gale, Roberts, Rielly, Chrystall, and Halliday (Assistant Hon. Sec.).

CONFERENCE OF UPPER-NORTH BRANCHES.—Members of this Branch expressed themselves in favor of a Conference being held at Orroroo.

SEEDING.—Discussion on the question of seeding under present conditions took place. Some members thought that it would be safe to sow if the seed were drilled in deeply. Others considered it too risky to commence seeding until the soil had dried somewhat or until more moist conditions set in.

Wirrabara, March 26.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. P. Lawson (chair), Curnow, Hollett, Stevens, A. and H. E. Woodlands, Marner, Hoskins, Kendrick, H. Lawson (Hon. Sec.), and two visitors.

BLACKSMITHING ON THE FARM.—The Hon. Secretary contributed a paper on this subject. While he did not wish to reflect on the professional blacksmith, farmers had to look at this question from their own viewpoint, and that was that numerous small repairs were needed from time to time to the implements and machinery. In addition to loss of time involved in sending these to the smith the yearly expense would amount to a considerable sum. The outfit required by the man who intended to do most of his own blacksmithing need not cost more than £16 or £20. It would consist of bellows, anvil, vice, tongs, a couple of hammers, screw tackle, cold chisel, and a few punches. Useful scrap iron could often be bought cheaply at sales, and this, with a few bars of good iron, would enable a handy man to save pounds in the course of a year. At harvest time a man might lose pounds worth of time over a small job if he had not the appliances to do it himself quickly. It was not unusual, owing to pressure of work at the blacksmith's, for a job which could be done in a few minutes to waste half a day for the farmer. If small breakages and disorders were put right promptly the life of many implements and machines would be considerably prolonged. On wet days, instead of being idle, with the necessary appliances at hand, a farmer could mend chains, make S hooks, and eyebolt and many other useful things for general farm use. Of course, such an equipment as described would not be sufficient for a farmer to attempt to manufacture implements, and he would be unwise to attempt such tasks as required a tradesman's skill and experience. To give the best care to farm plant and get the most out of it it was necessary for the farmer to do his own blacksmithing.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Brinkworth, April 26.(Average annual rainfall, 14 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Davis (chair), Brinkworth, Stott, Wood, Rowe, Nettle, Wundke, and T. Hill (Hon. Sec.).

FARM MANAGEMENT.—A paper from the *Journal* was read on this subject and general discussion ensued. The Hon. Secretary spoke of the provision of summer fodders as being an essential part of farm economy. Not only was the health of the stock improved by suitable summer fodders, but the carrying capacity of the farm was increased. The need for proper facilities in country towns for marketing the produce of the farm was touched upon by Mr. Paltridge. Everything should be provided to enable farmers to get the best prices. Mr. Brinkworth emphasised the necessity for keeping fences in repair. All buildings, harness, &c., needed constant attention. He believed in feeding the farm horses well and frequently, and in giving them a drink before feeding. If the bits were left in their mouths they would not drink too quickly. The Chairman also advocated

regular and frequent feeding of horses, measuring out limited quantities each time. He also believed in grading seed wheat. He did this last season and gained from 2bush. to 3bush. per acre by so doing. He thought others would have a similar experience if they graded seed.

Georgetown, March 25.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Hill (chair), Fogarty, McDonald, P. and J. Higgins, Thomson, Myatt, Bond, Brogan, Smallacombe, G. and A. S. Inglis, Freebairn, Noonan, McAuley, and Eyre (Hon. Sec.).

CONFERENCE NOTES.—Mr. G. Inglis read a paper dealing with an aspect of the recent Conference which he thought needed discussion. He thought the farmer did not get much benefit from addresses and demonstrations such as those given by Veterinary Surgeon Desmond at the Conference on February 23rd. In his opinion the only practical advice given by the veterinary was that frequently horses' teeth were completely ruined by being cut, when all that was necessary was to round off the projecting parts with a rasp. While the blackboard illustrations were to a certain extent interesting, the veterinary omitted to indicate the treatment necessary except in respect to colic, and then only when asked directly by one of the audience. The *post mortem* made in the afternoon showed how to cut up an animal for this purpose, but what the farmer wanted was to know how to save life. They wanted to know how to detect the presence of worms in the horse, and how to treat them. His advice to owners of animals suffering from stoppage, to leave nature to cure them, was not likely to appeal to owners of valuable stock. If this treatment was the best, it seemed to him that they did not want veterinary surgeons at all. While he admitted that sometimes horses were killed by medicines administered by the owners, he was satisfied that unless horses had proper attention when ailing, the percentage of losses would be much greater. He certainly took exception to the veterinary's remarks as to the way farmers usually fed their horses. While some were undoubtedly lacking in this respect, the average farmer realised the necessity for proper attention being paid to this. [In regard to the complaint that the veterinary omitted to suggest the treatment of various diseases, it is only fair to say that the veterinary distinctly invited the audience to ask questions concerning diseases, &c.—Ed.].

Port Germein, March 23.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Carmichael (chair), Deer, Holman, Hillam, Stone, Turner, Crittenden Blesing (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Crittenden. Mr. Crittenden conducted members over the farm and showed his implements and machinery, many of which he had made himself. A portable steam engine supplied power to the chaffcutter, lathe drill, and other machines in the blacksmith's shop. A machine quite new to the visitors was one for crushing quicklime and seashells to a fine powder, to put on the land through the seed drill. A tram-line was laid from the chaff-house, passing behind the manger. A very interesting implement at work was a 12-furrow plough with seed and fertiliser attachments. This was made entirely on the premises. Two of these implements, each drawn by 10 horses, would plough and sow from 25 acres to 30 acres per day. The visitors were then entertained at lunch by Mrs. Crittenden, and the detail business of the Branch was conducted.

Port Pirie, March 19.

Average annual rainfall, 12½in.)

PRESENT.—Messrs. Johns (chair), Munday, Greig, Welch, Jose, Eagle, Kavanagh, McEwin, Smith, and Wright (Hon Sec.).

GEORGETOWN CONFERENCE.—Delegates reported on proceedings of Conference. The Chairman said the agenda paper was too crowded, and the result was that the business had to be hurried through, leaving very little time for discussions. The Hon. Secretary agreed, and regretted the defeat of their suggestions for the management of Conferences.

TAKEALL.—Regret was expressed at the absence of any report from Professor Angus on this subject. The Branch had gone to some trouble to assist him in his investigations, but had heard nothing further about the matter.

QUEENSLAND.—At request of the members the Hon. Secretary read a paper on his recent visit to Queensland, from which the following is extracted:—"For the purpose of this paper I will confine my remarks chiefly to the district in the neighborhood of Toowoomba. The climate of Southern Queensland is all that can be desired in the summer time, and if it is warm occasionally during the daytime, the nights are generally cool and pleasant, and frequently during our visit heavy dews fell. The Darling Downs, in the vicinity of Toowoomba, is a rich piece of mostly undulating country, timbered chiefly with iron-bark, a timber which is said to be proof against the ravages of white ants, and which is used extensively for wheelwrighting purposes. The land is of a black mealy nature, and, unlike most of our South Australian soils, it is naturally rich in the constituents necessary for the growth of the various crops, and artificial manures are not required. The land cracks badly if a prolonged spell of dry weather is experienced. It is simply ploughed up, and in most cases, not cultivated unless weeds grow, the work of reducing it to the right tilth being left to the natural elements, which leave it in a fine mellow state. The average annual rainfall of this district is about from 30in. to 35in. We were fortunate in visiting the Downs at a time when the farmers were enjoying one of the best seasons which has been experienced for many years. Previous to Christmas time the grass and feed was quite dry, but about that time good rains fell and the crops and feed grew luxuriantly, and now a most prosperous season is almost assured. This district is essentially devoted to dairying, nearly every farmer keeping a herd of dairy cattle, and under the present circumstances it would be difficult to find a district better suited for that purpose. At Wyreema there is a condensed milk factory, and most of the milk which is produced in that vicinity is purchased by the milk company and made into condensed milk. This company supplies each dairyman with a boiler, which is erected on the farms free of cost, on the dairyman agreeing to sell his milk to the company. The boiler is used for heating the milk, each morning and evening immediately after milking, to a temperature of 150°, so that it is kept warm until delivered at the factory. Through the courtesy of the manager we were shown over the factory, and had the opportunity of seeing the various operations through which the milk goes before it is tinned, labelled, and finally packed in the cases. The output of the factory is about 3,000 tins of milk per day. Lucerne, which is the staple fodder crop of the district, is grown on an extensive scale, and paddock after paddock for miles around may be seen with lucerne crops averaging from 18in. to 2ft. in height. The crops are mostly cut for hay, and are estimated to return from 1 ton to 30ewts. per acre. After the first cutting the subsequent crops are, under favorable conditions, cut about every five weeks, and in the good districts as many as eight crops are harvested in a year, and these are all grown without any irrigation whatever. Hungarian lucerne seed, we were informed, was generally sown in preference to other varieties. Although heavy crops of maize and lucerne can be grown in the good seasons, ensilage-making is not practised to any great extent, the natural feed—when obtainable—being considered quite good enough for milk production. Owing to the irregular climatic conditions of the country there is not always such an abundance of feed as at present; more often, in fact, there is a scarcity. At times the farmers have to work under adverse conditions and are at a loss to know how to keep their stock from starving, and it is surprising to find how very few farmers go to the trouble of making ensilage to conserve fodder until it is needed in the dry seasons. Maize makes excellent ensilage, and very heavy yields of green fodder can be obtained if the seed is sown thickly. It grows very quickly; some of the crops which were sown only about a month previous to our visit had attained a height of from 6ft. to 10ft. The maize for corn was estimated to yield between 40bush. and 50bush. per acre, the market value being about 3s. 3d. per bushel. Wheat is not grown to any extent in the Toowoomba district, the land being rather hilly; but further out past the ranges there is a large area of plain country which is very suitable for cereals, and such wheats as Gluyas Early and Carmichael's Eclipse are grown with satisfactory results. In several country towns a system of selling wheat by auction is being adopted, and as much as 5s. 6d. per bushel has been realised this season for small parcels of Manitoba wheat. The principal natural fodder grass of the Darling Downs is blue grass, which is a splendid feed for stock, and many thousands of acres of it may be seen from 1ft. to 18in. in height. Apart from the blue grass, many other fodder grasses are grown, such as *Paspalum dilatatum*, *Phalaris commutata*, Rhodes grass, and prairie grass. Several varieties of millet, and also sorghum, panicum, and pumpkins, are grown as feed for the cattle. The climate of Queensland is eminently adapted for fruit-growing; and, besides growing practically every kind of fruit that we have in this State, pineapples, bananas, mangoes, and many other fruits of a like nature thrive well in a most congenial

soil. Many kinds of nuts are also grown, but almonds are scarce, the market price at Toowoomba being about 3s. per pound. Although the Darling Downs country presents a prosperous appearance at the present time, like a great many other places in the Commonwealth, the seasons there are uncertain; and, although South Australia has been through bad times in the past, which, no doubt, will come again, taking our farmers on the whole they appear to be a more prosperous community than their neighbors of the eastern States. Taking everything into consideration, the South Australian farmer has much to be thankful for and very little to complain about."

Port Pirie, April 9.

(Average annual rainfall, 12½in.)

PRESENT.—Messrs. Johns (chair), Munday, Welch, Greig, Noll, McEwin, Hawkins, Jose, Birks, Hector, and Wright (Hon. Sec.).

FARM FENCES, YARDS, AND GATES.—Mr. Greig read the following paper on this subject:—“The provision of fences, yards, and gates are matters of great importance and considerable expense, even on settled or fenced land, and much more so when taking up new country. One of the first matters requiring attention when starting in new country is fences and yards; and in a country so sparsely timbered as South Australia it becomes a serious question how best to combine effectiveness with a minimum outlay of cash and labor. First will be the question of the material to be used; locality will, in most cases, affect if not determine this. In parts where there is no timber suitable for fences, or where timber has to be carted very long distances, iron posts may be used. They are at best a poor substitute for wood, and without very substantial strainers placed comparatively close together are not worth the name of a fence. They are also expensive. I notice that reinforced concrete has been used in a few cases and has proved eminently satisfactory, and in timberless country, where sand and gravel are easily obtained, such posts may yet be largely used. One great point in favor of such posts would be that they would be everlasting in either wet or dry country, and would withstand the depredations of the termites. Cement would be the prime factor in the cost, and where suitable sand and gravel could be easily obtained the cost should not be very great. In most parts where farming is carried on in this State, however, timber is obtainable, and in many parts there is considerable choice possible, such as red gum, blue gum, sugar gum, peppermint or box, mallee, sandalwood, pine, myall, mulga, black oak, swamp or bull oak, and titree. We have here a dozen different timbers, and with three exceptions I have heard them condemned as utterly useless for fences; and with about a similar number of exceptions I have heard them very highly spoken of for fencing purposes. Probably, not seven out of 20 practical men in the State would class the same one of those timbers as best. There must be some reason for so great a diversity of opinion, and I will briefly refer to some of the factors which I think may have led to this. First, the soil in which the posts are put may be clay, loam, limestone, or sand. These different soils may have quite a contrary effect on different timbers. Then, too, the soil being wet or dry may have quite an unforeseen effect. The condition of the timber when cut, whether the sap was full up in the tree or whether the tree was quiescent when cut. This, I believe, is a very important factor in the durability of posts, and I would strongly recommend that posts be cut when the sap is not flowing freely. Placing posts in the ground in the green state as soon as cut may have quite a contrary effect with one timber to that which it has with another. I noticed a short time ago that a writer on fencing stated that posts should always be erected with that end of the post in the ground that was uppermost in the tree. I have also heard people say that as a rule timber will last longer when erected a considerable distance from where similar timber is growing. Another very important point is that all timber used for posts should be matured and not young growing stuff. My choice from the above-mentioned timbers would be myall, pine, red gum, blue gum, peppermint, black oak, sandalwood, and sugar gum. So far as mallee or swamp oak are concerned, I consider it a waste of time to put up such timber. Mulga, I have been told, is superior to myall, but I cannot vouch for this. I saw titree on Kangaroo Island, said to have been erected over 50 years ago, and it was apparently as good as the day it was put in the ground. Having decided on the timber to be used, the plan of the fence to be erected should be decided upon, and I strongly recommend that all new fences should be erected with a view to their being made sheep-proof ultimately; if not so made at first this may be done by additional wires, or by putting on netting. The latter makes by far the most effective sheep-proof fence, but it is risky to erect in country that is liable to drift. I would, therefore, not recommend it unless vermin are

very troublesome. The height of an ordinary farm fence should not exceed 3ft. 7in. and should be bored to the following gauge when posts are put up, but not necessarily all wired. Starting from the ground the bottom hole should be 7in. up, the second 13in., the third 19in., the fourth 26in., the fifth 34in., the sixth 43in. This makes an effective fence for sheep, cattle, and horses. If only large cattle and horses are depastured the three bottom wires need not be put in, although if calves or young cattle are kept it is well to have four wires in. If it is to be a rabbit-proof fence the posts should be bored as follows:—Again measuring from ground, the bottom wire 16in., the second 26in., the third 37in., and the fourth 43in. This is for 42in. x 1 $\frac{1}{2}$ in. x 18 gauge netting. Anything less than this is not quite effective. For either of the above fences in the open paddocks I would have a barb wire 14 x 3 securely wired to the top of the posts. All the other wires could be plain. The posts should be 11ft. apart. Such a fence requires posts 5ft. 4in. in length with 21in. in ground. One inch less may be put in ground if they are large round or split posts as these hold better. Strainers are an essential in making a good fence, and I would recommend for these red gum cut from limbs of mature trees 10in. to 18in. in diameter and 7ft. 6in. to 8ft. in length, according to position in which they are to be placed. Ordinary strainers in a line should be 3ft. in the ground, and corner and gate posts at least 3ft. 6in. The distance apart for strainers depends largely on the ground. On level ground or ground of an equal grade 7chns. or 8chns. is not too far, particularly if split posts are used. With small round posts such as myall there should be a strainer every 5chns. Stays to strainers are, as a rule, a fraud. The most effective stay is a slab of wood or stone placed horizontally at the back of the strainer, the top of it coming up to the level of the ground. All holes for wire in strainers should be at least $\frac{1}{2}$ in., this gives room for two wires and a peg to hold the wire whilst tying. Ordinary posts may be bored $\frac{1}{2}$ in. or even less, but I prefer the $\frac{1}{2}$ in. as it is not so liable to collect dust or hold moisture and rust the wire. For yards and small enclosures by far the best fence is made with posts and rails. This, however, is rather expensive in most cases, and frequently almost impossible. We have, therefore, to a large extent to fall back on wire. This serves the purpose in a sort of way for hay yards and such like, but when it comes to a yard in which stock has to be handled wire alone is a complete failure. On every farm there should be at least one yard fenced with posts and rails, a stump fence, stone wall, or posts and rails with wire between, and such fence should be at least 5ft. in height. Three rails with intermediate wires will make a yard that will be found very serviceable where timber is scarce, but four rails and a good cap makes a yard in which, as a rule, you can retain cattle. Barbed wire should not be used on fences of yards or small enclosures near the homestead, more particularly near where any stock are fed. Such yards as here mentioned are, of course, only suitable for quiet farm-bred cattle or horses. The corner and gate posts should be 3ft. 6in. 4ft. in the ground, and ordinary posts 2ft. 6in. Gates are one of the most important fixings on a farm, and yet they are one of the most neglected. It is surprising the wonderful arrangements you will find on some farms. One gateway will be stopped with an old stripper, another with the horserake, the next with the stepladder, and yet another with the wheelbarrow, minus the wheel of course, whilst others will be fixed up with wonderful combinations and complications of barbed wire, and yet I venture to say there is no farm appliance that pays better than a good gate. In the matter of time alone in opening and closing it soon pays for itself, to say nothing of the saving of worry, irritation, and temper, often leading to lurid language, and frequently there is loss of blood and skin in addition to damage to clothing, through negotiating one of these awful arrangements. There is another arrangement that is frequently used, that is the slip rails or slip panels. These are just about perfect for making fence-crawlers of both cattle and horses, and yet a gate is about as simple a thing as any to make, so that any farmer can construct his own gates, all that he will require to buy being the timber and bolts. The opening for an ordinary field gate should be 12ft. This is sufficient for most machinery. An ordinary field gate should be made with three rails 4in. x 2in. stringybark, the heel piece or upright post for hinge end of 6in. x 4in. jarrah, and the head piece 4in. x 2 $\frac{1}{2}$ in. jarrah. The rails should be cheeked into the back of both posts to a depth of 1in., and the rails should be cheeked $\frac{1}{2}$ in. so as to give a shoulder against the posts. Hinge plates may be made out of, say, old spring dray tires, and should be a single plate turned round towards what was the inside of the tire and formed into a $\frac{1}{2}$ in. eye for the post hook. They should be bolted on to back of rail and right through. The eye of the hinge plate should be kept close up to the back of the post. The single hinge plate and the cheeked-in rails are a great improvement on the more elaborate and expensive double-forged plate and morticed-in rails as the latter cannot be tightened up when slack or shrunk, whereas the former can be screwed up tight at any time. Two wires strained between the bottom rails and one

between the top rails will make this gate sheep-proof. To prevent sagging or going down at the head or swinging end of the gate a hole may be bored through the bottom end of the head piece and the bottom rail and a wire passed through the hole, and the two ends strained to top of the heel post, not sufficiently tight to pull the gate out of the square. In the event of sagging, twisting the two wires together will keep the gate right, and is far more effective than any angle stay bolted to a gate. For yards, four or five rails may be necessary, and in such case the heel piece should be 8in. x 4in., as the heel piece is the main factor in a gate. All gates should be from 3in. to 6in. higher than the adjoining fence. I have been using gates of this description for over 20 years and find them far handier, cheaper, and more durable than those made of iron." A lengthy discussion followed. Mr. Hector had adopted the same gauge for the wires as suggested by Mr. Greig. He preferred red gum timber for fencing posts. It had yet to be proved whether myall would stand well in wet districts. As timber was getting scarce in South Australia he thought that concrete posts would ultimately be used. These posts would have many advantages over wood, as they would be fireproof and there would be no holes to bore. It was a good plan to make gates higher than the fences. He could not agree in regard to a wooden gate being superior to an iron one. He preferred iron because the best of wood will rot, but an iron gate should last a lifetime, and they are exceedingly strong and cheap. Mr. Birks said there was not much room left for argument. Gate posts and corner posts he would have 8ft. in length, sunk 4ft. into the ground. He preferred myall timber for fencing posts. Red gum was a good timber, but there was much difference in the quality of it, some of the posts lasting much longer than others. An iron gate was very desirable for a front entrance, but for utility and cheapness he favored wooden gates. He used 4in. x 1½in. timber in making farm gates, and on an average they have cost, hinges included, 25s. each. Where crossbred ewes were kept it would be an advantage to have the fences 3ft. 8in. high, and to use seven wires instead of six. Mr. Hawkins agreed in the main with the paper, but he preferred two barbed wires in a fence of six wires. These would keep the stock from reaching through the fences and pushing them over. A good stockyard was very desirable on a farm. Mr. Noll, 30 years ago, had a fence of white mallee posts erected on his property, and although he had to replace the fence quite recently, a large number of the original posts were in good enough condition to be placed in the new fence. His experience in regard to red gum timber was that many posts rotted or snapped off just above the ground. A gum fence which had not been erected for 10 years he has had to replace owing to the aforementioned troubles. In some parts of the fence the posts had stood well, and he considered that the value of red gum for fences depended to a great extent on the locality and class of land on which it was grown. Well-matured timber should be used for posts. Mr. Munday agreed on most points with the paper, but he differed from Mr. Greig as to the value of mallee as a fencing timber. Blue box mallee, he considered, was almost equal to red gum for fencing posts. He had a fence on his farm, which was erected 28 years ago, and it was in comparatively good order at the present time. The true white mallee would stand well for many years, and he preferred it to myall. He had used what was said to be myall, but had found that some of the posts were worm-eaten, and decayed just above the ground, and broke off. He was inclined to the opinion that these posts were not the true myall, but a timber which resembled it very closely, and which is not of such good quality. The gauge for the wires as suggested in the paper was correct, but he disagreed as to placing the fence posts 11ft. apart; 9ft. apart was quite wide enough. With reference to gates Mr. Munday said that his had not cost him above 16s. each. The Chairman advocated having longer strains in the fence than those suggested in the paper. He said that as long as the wires run freely through the posts, the longer the strains are the longer will the wires keep tight, and they will not be so liable to break. Half-inch holes were large enough for myall posts, as the holes generally kept free from dirt, but in mallee they should be ½in. holes. He favored having two barbed wires on the fences. For farm use a wooden gate was preferable to an iron one. If an iron gate was knocked out of shape and twisted or bent by stock it was a difficult matter to repair it. Mr. Greig, in replying, said that the majority of timbers stood better when dry, excepting myall, which he would put in the ground the day after cutting, if possible. Mallee, in his opinion, was not a suitable timber for fencing purposes.

Redhill, March 29.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Stone (chair), Treloar, Pilkington, Steele, Cox, and Dunsford (Hon. Sec.).

VETERINARY SURGEONS FOR COUNTRY DISTRICTS.—A letter was received from the Advisory Board in reference to a resolution passed by this Branch at a previous meeting, to the effect that the Board considered this to be a matter which the stockowners themselves should take up by guaranteeing a reasonable salary to a qualified veterinary. Members expressed disappointment with the action of the Board and thought the Hon. Minister should have been approached on the matter.

PICKLING SEED WHEAT.—In giving a report of the Georgetown Conference the Hon. Secretary referred to the remarks of the Assistant Director (Mr. A. E. V. Richardson, B.A., B.Sc.) concerning fungusine. Members accordingly decided to each try this pickle on 10 bags of wheat.

MARKETING WHEAT.—A paper to the following effect was read by Mr. Coffey at the February meeting :—When quite a lad, the writer was at a loss to know why only the total weight of a load of wheat was recorded and handed to the farmer by the agent who bought it, and was much surprised at the apparent indifference of the growers in the matter. A man might spend hours trying to get an extra farthing per bushel, and after selling perhaps thousands of bushels seemed quite content to take the agent's figures as to the total, being satisfied that scales were quite correct and no clerical errors were made. The bar of a weighing machine might be balanced to a nicety and yet when the weight was put on it would sometimes weigh most erratically. He was convinced that some inspection of scales should be made by authorised persons during the wheat season. He had seen scales which weighed 8lbs. short on every 4bush. of wheat, and at that time that meant 6½d. per 4-bush. bag. At the time of his discovery thousands of bags of wheat had been sold on the weight recorded by this machine. He did not think that such a discrepancy would be knowingly permitted by a reliable wheat agent, but it was something that ought not to occur. Very severe measures were taken to protect the public from fraud in many directions, but here was a case in which, apparently, there was no supervision. Finally, he would urge all members of the Agricultural Bureau to use their weight to bring about the following :—(1) An improvement in the quality of the standard wheat sack. (2) The inspection, by surprise visits, of scales used for weighing wheat, in the same way as weights and measures are inspected. (3) The compulsion of wheat-buyers to give every teamster an exact copy of the weight of the bags. [It is the duty of the local district councils to test the scales of storekeepers, wheatbuyers, &c. Members of Branches should bring the matter before their local representatives at the beginning of the wheat season.—Ed.]

Whyte-Yarcowie, April 23.

(Average annual rainfall, 13½in.)

PRESENT.—Messrs. Pearce (chair), T. and H. M. Pascoe, Hunt, Ward, G. R. and G. D. Mudge, G. F. Jenkins, Lock (Hon. Sec.), and one visitor.

PREPARATION OF THE SOIL FOR SEEDING.—Mr. Jenkins introduced this subject for discussion. He said that fallowing should be done early, and he preferred to plough 4in. or 5in. deep. The ploughed ground should be harrowed at a seasonable time to level it and to break up the lumps. It should then be cultivated during spring to kill the weeds, and, if possible, after summer rains the surface should be loosened to help to conserve the moisture. At seeding time the amount of work depended on the nature of the soil, and whether before or after rains. It was a mistake to work stiff soil down too finely when dry, as it would cake after rain. It was better to leave it a bit rough and harrow it after rain. He did not believe in drilling very deeply, and thought 1½in. was quite deep enough. Members generally agreed with the speaker. The Hon. T. Pascoe mentioned that the different qualities of land to be found even on the same section made a hard and fast rule impossible, and said that fallow should be harrowed before the lumps became consolidated, as the most important thing in comparatively dry districts was to conserve as much moisture as possible, and generally the difficulty was to keep the land friable. One member had found that shallow ploughing—about 3in.—had given the best results on his land. Considerable discussion took place as to the best means of dealing with hard patches, and it was agreed that stable manure, cocky chaff, or old straw spread over these was the best thing to do. The Chairman spoke very favorably of disc implements for loose soils, as they packed the soil better and made a better seed bed. He also mentioned having inspected a stable manure spreader which had given the owner satisfaction. The cost was £40, and he thought it would be a good idea for several farmers to obtain one jointly, and in this way utilise stable manure to greater advantage.

Yongala Vale, April 16.

(Average annual rainfall, 13½ in.)

PRESENT.—Messrs. Battersby (chair), D. and G. Dowd, Chigwidden, Marshall, A. W. and A. Jamieson, Fowler, Cooper, Fogerty, Keatley, Schmidt (Hon. Sec.), and two visitors.

CONFERENCE NOTES.—Discussing Mr. Fowler's report of the Conference at Georgetown, members thought it would be a difficult task to prevent the importation of adulterated seeds, and that the evil might be checked by having an agent in Europe, who would select the seeds before they were gathered; thus only the seeds of clean crops would be secured. Members favored the appointment of four or five more veterinary surgeons. Co-operation received favorable consideration, and an early start to general was recommended, as labor is becoming more scarce every year.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Balaklava, March 12.

(Average annual rainfall, 15½ in.)

PRESENT.—Messrs. Neville (chair), Anderson, Tuck, Thomas, Roberts, Roediger, Goldney, Uppill (Hon. Sec.).

GRADING SEED WHEAT.—Discussion on this question took place. Mr. Tuck said that while the results from grading seed might not be as good as could be wished for, the grader was better than any other machine for cleaning wheat. All small and cracked grains were removed, and could be used as food instead of being put in the ground to waste. The process of grading was, however, rather slow. To put through from 20 to 25 four-bushel bags and pickle them was a fair day's work. Messrs. Roediger and Thomas had obtained more even crops from the use of graded seed, the germination being better than from that which was ungraded. Mr. Roberts also considered crops were more even from graded seed, and that there was a considerable saving, as most of the damaged grains which would not germinate were removed. Mr. Anderson approved of grading. He considered, however, that the past few seasons had been favorable to a good sample of grain, and that the results from grading seed were not so marked as they might be in a less favorable season with an inferior sample. He had obtained selected seed from Roseworthy College of King's Red variety, and the resulting crop was very even, with ears of uniform size. Mr. Goldney had not graded seed wheat; he considered that seed run through a good cleaner after it came through the harvester would be practically as good as that which was graded, although of course small and cracked grains would not be removed so thoroughly as with the grader. There was a good deal to be said with regard to the selection of seed, and he referred to the results obtained from selected seed supplied by the Roseworthy College. The Chairman had sown graded seed, and also some cleaned with the winnower, but there was no difference in the yield. He believed that the modern damp-threshing gear on reaping machines injured the seed to a certain extent. Selection of seed was an important matter. Selected Federation grown by him in connection with experimental plots was perfectly free from black rust [flag smut.—Ed.], while other varieties alongside were badly affected.

Balaklava, April 12.

(Average annual rainfall, 15½ in.)

PRESENT.—Messrs. Neville (chair), Fisher, Tuck, Curtis, Goldney, Traeger, Hoepner, Roberts, Uppill (Hon. Sec.), and four visitors.

COLT-BREAKING.—Mr. Tuck initiated a discussion on this subject. Animals that should be good horses were often spoiled in the breaking in. He thought it best to handle the animals as foals, but even then they required a certain amount of breaking before they could be put to work. In the first place, for catching, a crush pen with a swing gate was a very good plan, but he rather favored a round yard of posts and rails about

6ft. high, with a post in the centre. The method was to catch the colt with a lassoo or rope on a stick in the usual way, and keep it running round, pulling it up gradually, so as not to hurt it or choke it down. Coax it until you can get up to it, but do not be in a hurry. The colt will soon give in; just let him see that you are going to be master. Teach it to drive with the side reins and to lead; but the most useful thing of all is to tie up. If a colt will tie up you have him under all circumstances. When he is put in the team, tie him to the next horse, and even if he gets out of all harness you have him, and he will not try the same as one that is not used to tie up. If you depend on coupling to the next horse's mouth in the ordinary way he possibly will break the couple and get away. Mr. Tuck favored putting the colt on the outside of a team, where, if it pulled back, there was not the danger of bringing the whole team back over the implement. He would simply pull the team gradually round in a circle. He thought an open bridle was best to use at first, as if a colt got away, as they sometimes did, there was not the same danger of his galloping over fences. In breaking light horses he would mouth up in the usual way, but would not depend altogether on that. He would also use the side reins to teach it to drive. It was unwise to drive too often, too far, or too fast. The horse might be broken in at two years, but its legs would stand no running until four years. When putting in double harness he always tied the horses together, and preferred a light trolley to a log for the first time. The draught was higher, and there was not the danger of the colt getting his legs over the traces. He believed in breaking in to single harness. He often put them in for the first time, but it was necessary to be careful in starting not to disappoint him the first few times, but rather to help the colt away without his knowing it. Mr. Fisher would put the colts on to a log first, and use leather traces, as the youngsters were not so likely to kick with traces, and if they did, leather would not damage their legs to the same extent as chains. A lot of the useless horses about had been spoiled by bad breaking in. Mr. Traeger thought it necessary to be able to judge a horse's temper and handle him accordingly, and always put him on to a log first. Mr. Goldney believed in handling from a foal and gradually bring them to it as they grew up. Mr. Baum thought it best to handle the colts for a few dyas, and then give a spell before putting them into harness. He considered they were better broken that way, and would learn more quickly. Mr. Hoepner considered the best way to give a colt a mouth was to tie a rope from the bit to his tail and let him go in the yard, and after a time tie to the other side. Mr. Roberts favored putting on to a log and then into a team with leaders, and tie the colt to the spreader by the neck. Mr. Curtis always put a colt in the body of a wagon team for the first time. The colt then considered that he always had to go, and it would teach him to start. Mr. Underwood had broken in a lot of colts both to ride and drive. He did not believe in putting on to a log, and considered a light trolley best. He favored putting into single harness. The Secretary emphasised the wisdom of always teaching a colt to tie up. With a bad-tempered colt that was inclined to kick or strike he would get him into a loose box or stall and rub him down with a loose bag or a stick until he gave it up. With a light horse, if it was inclined to be bad-tempered, he would not favor breaking in until it was old enough to stand sufficient work to keep it quiet. The Chairman favored putting into a light trolley first, but did not couple in the ordinary way from the bit. He just tied him on by the neck for the first time. He had a light filly that he could not get to trot in light harness, although a beautiful trotter out of harness. He asked the members' opinion as to the best way to check it. Members generally favored giving it plenty of work, considering that was about the only way.

Clare, April 1.

(Average annual rainfall, 24in.)

PRESENT.—Messrs. McCarthy (chair), Scales, McKenzie, Paseoe, Jarman, Lockyer, Kearne, Kollosche, Maynard, Radford, Kelly, Lee, Hughes, Victorsen, J. H. and P. H. Knappstein (Hon. Sec.), and two visitors.

IMPROVING FARM STOCK.—Mr. J. H. Knappstein read a paper on the question of farm stock improvement. "Often when travelling through the country we hear it said 'What a wretched class of cattle is to be seen.' Sad to say, it is only too true; whereas we could by the judicious use of sires have a good class of grade cattle, which would be equally good, if not better, as milkers, than those which are generally stocked on a South Australian farm. A really good Shorthorn bull of a milking strain on every farm would in a few years work wonders in the farm herds, and instead of seeing, as we do now, black, white, brindle, slab-sided, gable-rumped nondescripts we should have a robust type type of animal; the heifers for milking, and the steers good for the butchers, carrying good

flesh and weight; but I am sorry to say that few of our farmers seem to care what sort of a sire they use. Anything that will get calves is good enough. As regards sheep of late years, since mixed farming has been the vogue, the farmers' sheep have improved immensely, and I do not think there is much fault there, as most farmers know their business in this respect, but I should give this advice—Stick to pure sires of whatever breed you may choose. As regards horse-breeding, farmers in the past have been only too content to breed from the cheapest horse travelling, which has been a fearful mistake. On the farm it will pay to breed only a good class of colt, but how in the world can that be done if you are not careful of the breeding of the sire? Be sure and see that he is pure as well as sound. Bad qualities are far more prone to be transmitted than good ones, and I am sure we will be going in the right direction by having compulsory inspection of stallions by competent persons. With most farmers any sort of a pig is a pig. This should not be. The pig should pay or partly pay the rent, as he does in "ould Ireland," and the farmer should keep only that breed which he finds the best paying, because it is as easy to feed a well-bred one, and he eats less than a mongrel, which with their long snouts, humpy backs, and flat sides do little credit to any homestead. Personally I favor the Berkshire, as he is a good thriver, hardy, and an early maturer. I would impress upon you that purity of the sire and good feeding of the offspring go a great way in breeding stock of all sorts. Of course, in breeding pure stock it is equally important to see that the ancestors of the dam are as good as the sire, but this paper is not intended to be a treatise on pure stock, but is written with a view of trying to better our grade animals."

Gawler River, March 24.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Hayman (chair), Richter, Davis, Dunn, Bray, Dawkins, Roediger, Leak, Winckel (Hon. Sec.), and one visitor.

WHEAT PRIZES.—At the request of Mr. Richter, the fact that no prize was granted in connection with the competition held last season for new and improved wheats was discussed. On the motion of Mr. J. H. Dawkins, seconded by Mr. Davis, it was decided to enter a protest against the action of the Government in withholding the prize, as members saw nothing in the conditions to warrant such action. If the wheats entered had to beat all the older varieties it should have been stipulated in the conditions. [The report of competition in April issue deals with this.—Ed.]

Nantawarra, April 27.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. E. Herbert (chair), A. Herbert, Sleep, Greenshields, Dall, Sutton, Gosden (Hon. Sec.), and one visitor.

METHOD IN FARMING.—Mr. Dall read a paper setting forth the necessity for methodical working on a farm. There were greater facilities to-day than ever before, he said, for a farmer to carry out his work in a systematic manner. Various tasks could be performed at an opportune time and under favorable circumstances. One of the most important considerations on a farm in this district was the proper dealing with fallow. While it was quite right to get on to the preparation of fallow as expeditiously as possible, it was a great mistake to allow, as the result of undue haste, ploughing in wet weather. Heavy land ploughed in wet weather did not pay, and many acres could soon be spoiled by doing it. Boggy places formed by ploughing in the wet, when worked down, would turn up lumpy and open, and the result was very noticeable at harvest time. If a farm hand was set to plough the fallow, due supervision should be exercised by the farmer to see that the land was in a fit condition for it. He considered that there should be regular hours for work, both for men and horses, and thought that if they started at 8 in the morning and worked till just before sundown, with one and a half hours' rest at dinner-time, they had done a fair day's work, and working in this way would get through just as much as a team working longer hours. More method was needed in the matter of feeding horses. Farmers, to-day, nearly all had chaffcutters and avoided the waste that occurred when feeding long hay. At the same time a great deal of chaff was wasted by improper feeding. It was not possible to feed horses evenly from a bag. Some would get more than others, and often all would get too much. Horses should be fed separately, each one receiving a quantity that suited his appetite. The care of machinery and implements

was another important matter, and these should be periodically overhauled and kept in repair, so that no time should be lost when the implements were required for immediate use. If sheep were kept on the farm they should be selected carefully and never overstocked. It was a great mistake to stock more than the number which returned the most profit. At shearing time the fleeces should be skirted and the stained pieces made the most of. In this way the clip could be done up to look as fine as possible, and to finish all the bales should be sewn up carefully and neatly. It was wise to weigh the bales of wool as a check on the figures shown by the brokers. Discrepancies would frequently be discovered if this were done. Consignments of super., binder twine, &c., should also be weighed, as shortages in these items very quickly amounted in value to considerable sum. In the discussion which followed Mr. Herbert thought more time and money was wasted in waiting for boggy patches to dry than in putting them under crop right away. The views set forth in the paper were generally indorsed by all present.

LONG-TOPPED HAMES.—Mr. Herbert reported that one of his horses attempted to roll when in harness with the result that the long points of the hames were forced into the ground and the animal was nearly strangled.

ALMONDS NOT BEARING.—Mr. Sleep wished to know why his almond tree did not bear, although it blossomed profusely every year.

Northfield, March 23.

(Average annual rainfall, 19in.)

PRESENT.—Messrs. Williams (chair), Dall, Holbrook, McCauley, Wright, Goldney, Kelly, Kemp, and Mitchell (Hon. Sec.).

POTATOES AND ARTICHOOKES.—Mr. Holbrook said that having been disappointed with the shrivelled appearance of some seed potatoes which were sold to him as being "Up-to-dates," he left them in the bag. They remained for two years, and then he planted them. Although he looked upon it as a doubtful experiment, the result was a good crop of tubers. This year a self-sown crop from very small seed produced fine potatoes, showing that it does not always follow that small seed produce small tubers. He also exhibited partly-grown Jerusalem artichokes. These, he said, were capital food, as satisfying as peas and beans, and should be more widely consumed. Seed was obtained by cutting a matured tuber into several small pieces, each of which would yield twentyfold. If planted in September the crop was ready by March or April. Plants should be about 2ft. apart.

ADVANTAGES OF FARMING IN AUSTRALIA.—Mr. J. W. Dall read a paper on this subject. He referred to the difficulties which farmers and stock-owners in different parts of Europe and America had to contend with, particularly in regard to the long, cold winter. In the mild, temperate climate of the greater part of Australia, farmers possessed an immense advantage. In vegetables and fruit they could produce different kinds of crops practically the year round. They could produce wheat of quality unsurpassed, and as cheaply as in any part of the world. Their flocks and herds were to a considerable extent independent of the aid of man in the matter of shelter. The winter on the whole was so mild that housing of cattle and sheep was practically unnecessary. He questioned whether any timbered country could be brought under the plough more cheaply and quickly than the mallee lands, which cost on an average about 10s. per acre to get ready for ploughing. The ease with which these lands could be worked and the cereal crops harvested was another great advantage to the Australian farmer.

Salisbury, April 5.

PRESENT.—Messrs. Moss (chair), Sayers, King, J., A. J., and A. H. Harvey, McNicol, Urlwin, Richardson, Tate, E. and A. Whittlesea, Bussenschutt, Jenkins (Hon. Sec.), and one visitor.

DAIRYING.—Mr. McNicol read a paper on this subject. Given a sufficient quantity of milk-producing food, he said, no animal gave better returns than the cow. On some farms cows were kept with insufficient food for several months in the year, and then the owners had to buy butter, &c., and said cows did not pay to keep. Where the land was suitable and the lucerne flea was not known to be very troublesome the best fodder to grow was lucerne, but in some places this pest had made it practically impossible to grow that fodder. Next in value was maize and amber cane. The cows did best on the former, but this only gave one crop, while the amber cane could be cut twice or thrice if a little rain fell from time to time. It could be grown on almost any well-worked fallow, and should be sown in

September or October. If a block could be irrigated, it was best to sow plots every three or four weeks right through the hot weather. Amber cane should not be fed to cattle until the seed was turning brown, as before that they did not care for it, and indeed it contained up to that stage an amount of prussic acid sufficient to kill them if they should eat it. If green feed could not be procured, the next best fodder was oaten hay chaff, with plenty of bran and crushed wheat. A good plan of feeding was to mix up chaff and bran in an iron tank and damp it down well. After thoroughly wetting and mixing it, it should be left for 12 hours to soak. In deciding what breed of cows to procure the dairyman had to consider whether he wanted milk or butter. Butter-making or even cream-selling involved a great deal of labor, and was a constant tie. He therefore went in for milk production. In his experience the Shorthorn breed had done best, many of them giving 4galls. or 5galls. of milk per day. When the Jerseys were introduced great things were expected of them, but, although the first cross produced a good all-round cow, further crossing lowered the standard of the progeny. He had kept Ayrshire cows, but while they had certain recommendations, the teats were too short. In more recent years he had had splendid results from the Holstein breed. They were big cattle, docile, good milkers, and fair butter cows, but they required good country. One of them from this district recently tested for the Adelaide show gave 68lbs. of milk. For a family cow he recommended a Holstein-Jersey cross, as this would give good milk and butter.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Kadina, April 21.

(Average annual rainfall, 15¹/₂in.)

PRESENT.—Messrs. Malcolm (chair), Correll, Westphall, Spring, Taylor, Tonkin, Rose, and Southwood (Hon. Sec.).

POULTRY.—The Hon. Secretary read the following paper on the subject of poultry:—“The ravages of Reynard are gradually but surely bringing about an alteration in the farm-yard, and the farmer has either to pen up his poultry every evening or feed the foxes with them. The average town flock of fowls is also being improved by the weeding out of mongrels, and the proper housing and feeding of the pure breeds. The egg-laying competitions show that this penning-up is a paying transaction. It has been proved that it pay best—(1) To keep purebreds only, for egg production; (2) to divide the flock into small lots of 10 each; (3) to have only sufficient male birds for breeding purposes, and to allow one only in each breeding pen; (4) to breed only from proved layers, and to in-breed rather than to lose an exceptionally good laying strain; (5) to systematically feed the poultry; (6) to prepare the nests, and to collect the eggs daily; (7) if poultry-farming on anything like a large scale to use incubators. For egg production in this climate my opinion is that the White Leghorn cannot be beaten—that is, the laying strain. The hens will not go broody as often as do those of most other breeds, and when they do they are soon cured; they will very rarely sit. They are small, active birds, and all poultrymen know that the active bird is usually the best layer. Given reasonable attention they will show a much better return than can be gained from many other breeds. The old barn-door hen is not in the running with the pure White Leghorn bred for laying or for show purposes. In dividing a flock of, say, 200 hens—and no farmer should have less than this number—into pens of 10 each, the up-to-date method is to erect a continuous house right across the centre of the plot set aside as the poultry yard, and to construct double pens. This is necessary in order to keep the ground from becoming tainted. Although the limestone nature of the Peninsula soil will not allow it to become tainted as quickly as would be the case in places where there is not so much limestone and where the soil is not so porous, after a year or so it will be wise to plough up the pens and to plant them with rape, barley, oats, or even wheat. While the one side is being cultivated the other, of course, can be utilised by the poultry. Alternately resting the yards has been found necessary where poultry are penned up. It is a mistaken idea that the male bird running with the hens assists laying. As a matter of fact he retards it. He may keep the hens from quarrelling, &c., but his proper place is in the breeding-pen. He should be selected by reason of his masculine attributes. He

should be a lusty bird, a fine upstanding fellow, with an egotistical strut, a good crower, and should be from a proved laying strain. Style of comb and beauty of plumage are not disadvantages, but are not essential. See that his pedigree is satisfactory, and that he is healthy. The selected hens should be as feminine as the male should be masculine. Do not put crowing hens into the breeding-pen. There is no objection to mating last year's pullets with their grandfather. That is one way in which the strain can be preserved. On no account be rushing after fresh blood every year or so, and be very careful about introducing strange birds into the yard. That is one way in which disease is spread. It is important that good attention be paid to feeding, and the experience has been that nothing equals a mash every morning made up of bran and pollard, mixed with soup made from boiled rabbits, mutton, or beef bones. Mix the mass thoroughly into a crumbly mass—not into a sticky paste; and do not be afraid to put plenty of meat into it. Good soup is to be got from sheep-plucks. Boil the pluck for about an hour. Use the water for mixing the mash, and chop up the meat, also mixing it with the food. This should be fed as early in the morning as possible. Daylight is recommended; but as most of us do not rise thus early the hens have to wait a little later for their breakfast. Let this be remembered—the earlier they get to breakfast the sooner they get to business. At midday green feed should be supplied liberally. Most poultrymen can set aside a piece of land as a lucerne plot, and the manure from the fowl yard will materially assist in the growth of this most excellent food. White beet is also an acceptable green fodder. In the evening give the fowls good wholesome wheat, varied with barley and oats. The fowl yards should be covered with straw, and the wheat should be scattered over it. Thus the hens will get good, healthy exercise and no little recreation. It is a good plan—say an hour after they have had their breakfast—to throw a few handfuls of wheat into this straw and let them scratch for it. Part of the continuous house, which should be built of galvanized iron, should be set apart as a scratching-shed for winter time, and I advise all persons who desire to go in for poultry-keeping on the best lines to procure a copy of the Government Expert's book entitled "A Poultry Manual." It can be obtained from the Government Printing Office for 7d. post free. Then, in the matter of getting the best advice, it would be as well to write direct to the Poultry Expert, Adelaide. It is his duty as well as his pleasure to attend to all inquiries and to give advice to all who seek it." In the discussion which followed, Mr. Correll said that many farmers looked upon poultry only as a by-product, and he was of opinion that it would pay to go in for keeping poultry properly. As stated, the housing of poultry was becoming necessary by reason of the increase in the number of foxes. He had heard of cases where as many as 20 head of poultry had been killed by foxes in one night. It was a mistake to allow the poultry to go along in a haphazard manner without taking some care in their breeding. It was not wise to try and bring in the heavy breeds and to expect the best egg production. The lighter breeds were better for egg production, and certainly the heavy ones were better for the table. They should be kept separately. The chairman said it was astonishing the amount of wealth there was to be got out of poultry. The exports from America were enormous. The average farmer allowed his poultry to run about anyhow. Seldom were they given clean drinking vessels. In most instances the only drink they could get was from the drippings of a tap.

Minlaton, April 9.

(Average annual rainfall, 17in.)

PRESENT.—MESSRS. Boundy (chair), Parsons, Vanstone, Page, Bennett, Correll, and McKenzie (Hon. Sec.).

RESIDENT VETERINARY SURGEONS.—Considerable discussion took place on the question of the need for a resident veterinary surgeon for the district. Mr. Page thought a certain guarantee could be found by the residents, and that they should be assisted by the Government. Members agreed that a lot of valuable stock could be saved if a veterinary surgeon were available.

FRUIT AND VEGETABLES ON THE FARM.—Mr. Bennett read a paper, in which he deprecated the neglect of farmers in the matter of gardens. In the country towns too, he said, gardens were sadly neglected. He had a small piece of ground of just ordinary quality fairly handy to a well, and here, without previous experience, he had commenced gardening. In the winter he had cabbage, cauliflower, and lettuce, putting out fresh plants from time to time, and these lasted up to the end of December. Potatoes also did well, and were equal in size and quality to those brought from the mainland. He considered it would pay farmers well to grow potatoes, and they would get a prime sample

instead of the much-handled, grub-eaten specimens which were now sold to them. If water was available in the summer, tomatoes, cucumbers, marrows, troubones, pumpkins, sweet, rock, and water melons could all be grown. These were vegetables of much value as household food, and would be used a great deal more if locally grown. Farmers studied economy in practically all their farming operations, and this was a matter which might contribute considerably to the economical up-keep of the farm. Mr. Bennett exhibited samples of various vegetables grown on his property. These were fine samples, and members agreed that there were great possibilities on the Peninsula in vegetable-growing, and that it would pay farmers to give more attention to this matter.

Pine Forest, March 22.

(Average annual rainfall, 13in.)

PRESENT.—Messrs. Johns (chair), Bayne, Pearce, Carman, Goodridge, Nelson, Schultz, Edwards, Hewett, and Barr (Hon. Sec.).

SUMMER FALLOWING.—The Hon. Secretary read the following paper on this subject:—“I have to confess ignorance of this subject as far as practical experience goes; but from hearing and reading of well-authenticated instances of success attending the practice, I am theoretically a believer in the system, and if I could adopt it without any drastic change affecting other interests on the farm, outside of wheat-growing, I would not hesitate to carry it out. Summer fallowing may be described as one of the features of what is known as Campbell's system of “dry farming”—a term applied in America to all corn or wheat-growing lands without irrigation. Shallow ploughing, scarifying, or discing the ground directly after the crop is taken off is the first step in this system, and would be easy here in most cases, as the land is in good physical condition from last season's working, and ordinarily a good big area could be got over quickly before the rainy season sets in, as we do not usually get rains in this locality before the beginning of April. With our present method of harvesting, however, we run up against the necessity of burning off the stubble, which, however, unless we reckon upon the wastefulness of destroying fertilising properties contained in the straw, would not matter. Keeping sheep would be out of the question under this system anyway. The advantages of the shallow ploughing or discing are apparent. All seeds would be covered, and the land would be in better condition to receive and retain the moisture, and after seeding operations were completed on the portion of the farm to be cropped for the season this preparatory process would leave the land in an ideal condition for the deep ploughing to be performed later. This, in my opinion, should be not less than 5in., and could be experimented with up to 6in. or 7in. in some of our heavier soils. The months of July and August should see this operation completed, and if surface stirring of the soil is done at intervals up till hay harvest good results should follow the application of manure and seed next season. The matter of cultivating in front of the drill, or refraining from such would depend on the condition of both soil and season. Applying this system to land cropped the previous season would be practicable, and perhaps profitable; but the practice would entirely alter our present system of combined wheat-growing and stock-raising, because it would amount to a two years' course instead of a three years' or a four years' course, and for the greater part of the year—unless we set apart a portion of the farm under permanent pasture—there would be no outside feed for stock. But, supposing we applied the principle of summer fallowing to a four years' course. During the last five or six favorable seasons a fair covering of grass is left on the land that has been left out three years. To burn it off would not be the wasteful act of burning good stubble, yet, in my judgment, it would benefit the land to as great an extent. This could be burned off directly the burning period commenced, and a start made to plough it. Necessarily, I think, it would be an imperfect job on land consolidated by three years' rest; but with care in using good shares and putting on the draught a very fair job could be made, leaving the land in condition to grow as much feed and in very much better condition for the deep ploughing after the seeding time. If such a course could be carried out successfully it would suit Australian conditions much better than the other. It would entail no extra working, though the time of working would be altered; it would be no sacrifice of feed or destruction of humus—the last two considerations being matters of great importance where stock to the full capacity of the farm is kept. The same advantages would apply to a three years' course, whichever of these we as individual farmers have been practising in the past, and so no violent change of method or reduction of stock would be needed to experiment in the direction of summer fallow. If it were not so successful as expected or desired it could be dropped, and reversion made to the old style without getting the

different fields out of their rotation. Mr. A. S. Inglis, of the Georgetown Branch, gives his experience of the practice in page 785 of the year 1908 *Journal* as follows:—"Last year he fallowed 200 acres during the summer, cultivated it three times, and harrowed it twice. The result was a fine and mellow tilth. He prepared two acres of crop grown of summer fallow to three sown on land ploughed in August. He had practised it three years, and had a much better return from summer than from ordinary fallow, especially so during the preceding season." In the discussion which followed the Chairman said that a section broken up to a depth of 7in. about 50 years ago had been entirely ruined by it for wheat-growing, and still stood as a monument of that mistake, its worthless condition deterring all farmers in the vicinity from deep ploughing. Mr. Schultz was opposed to the practice of deep ploughing in the light soil of this district. His own practice was very shallow ploughing, and his average yield was much above the general average of the district. Mr. Edwards had a portion of land ploughed to a depth of 6in. to 8in. some years ago, without detriment or seeming advantage either to the ensuing or succeeding crops; but he had personal knowledge of a farmer in the Kulpara district who habitually ploughed his land much deeper than did his neighbors, and who invariably reaped higher yields as a result. Mr. Goodridge thought that "luck" entered largely into the question of wheat-growing in any district. The most successful farmer in the Laura district some years ago, for instance, did not use a plough at all, but only a cultivator and harrows. Mr. Carman, in speaking of the principle of summer fallowing as outlined in the paper, stated that it was no new innovation. In the Redhill district the practice was quite common, if not universal, with good results. Mr. Hewett considered the paper did not go far enough. It could be improved by the inclusion of growing early feed for sheep—either rape or peas—on the portion ploughed thus early, and then he believed it would be profitable. Owing to the prevalence of high winds, causing the sand rises to drift badly, it was the general opinion that unless some kind of fodder was grown it would be unadvisable to adopt the system of summer fallowing in this district.

WHEAT FOR DISTRICT.—Members considered the best wheats for the district to be as follows:—Yandilla King, German Wonder, College Selection, Silver King, and Gluyas.

WESTERN DISTRICT.

Colton, March 26.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Whitehead (chair), P. P. and M. S. W. Kenny, Hall, Packer, and Shepherd.

MACHINE AND CO-OPERATIVE SHEARING.—Mr. Packer read the following paper on this subject:—"A good deal has been said for and against machine-shearing, some praising while others ridicule it. But there has always been opposition to all mechanical improvements, for old systems die hard, and hand-shearing has come down to us from the early ages. One thing is sure, and that is that machine-shearing has come to stay. As it becomes more difficult every year to get capable hand-shearers—in fact hand-shearers at all—it is necessary to look round for the next best thing, and that at present is machine-shearing, for wool to be of any value to the grower must be got off the sheep's back and put into the market expeditiously. I think the principal reason of the scarcity of hand-shearers is that many who followed it year after year were young men who were working on the farm at home, and in the slack season put in a month or two at shearing. Many of those men have now homes of their own, and the young men of to-day have taken to machine-shearing. The work is not so laborious, and it is possible to make a much larger tally in the season, which means a bigger cheque. One reason for adopting machine-shearing is the more merciful way in which the sheep are used. Many of the hand-shearers of to-day are very rough, and in their haste to make a tally the sheep are cut and tomahawked shamefully. With the machine that cannot be done unless it is most carelessly handled. What most of us on the West Coast know about machine-shearing comes to us second hand, few (if any) having had experience. We have only one machine plant installed so far on this part of the West Coast, and the owner of it cannot speak too highly in its praise. In conversation he said that his sheep had recovered more quickly after the shearing, few losing

condition, and the growth of wool was more even and denser. There was no chaffing the fleece by second cuts, and he would be very sorry to have to go back to hand-shearing. Many of the objections against the machines are purely a matter of prejudice, and many of the faults are traceable to the man behind the shears or running the gear too slowly. While we do not hear of anyone who has adopted the machine going back to the old system, what troubles the small holder is how to avail himself of the machines. Large holders can erect a plant or engage one of the companies who are prepared to find all plant, men, woolclassers, &c., and deliver the wool at the shed door ready for the market. The fact that the companies require the number of sheep at one shed to be not less than 5,000, debars small holders from availing themselves of the companies. This being the case, the small holder has to look round for some other way to avail himself of the machines. This could be done in the same way as it is in Victoria, viz., by having a travelling plant for two stands or more, which is made in sections, and can be put up and taken down quickly. With a plant of this kind the shearing would be done so that the owner could point out any faults or what he would like altered to the man in charge of the plant. It would do away with droving and having the sheep penned up for a time. If the small holders are to get best value for their wool it must be placed upon the market in the most attractive way so that it may catch the buyer's eye. That can only be done by making use of the most approved methods. The small holders can best do this by co-operation." In the discussion which followed there was some difference of opinion as to the practicability of machine-shearing under present circumstances, but the consensus of opinion was in its favor. Mr. P. P. Kenny read an interesting letter from Mr. Coffee, of Redhill, strongly advocating co-operation after having given it a good trial.

Koppio, March 23.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), Brennand, Newell, Thompson, Howard, G. B., F., and M. Gardiner, Richardson (Hon. Sec.), and one visitor.

HOW TO MAKE BUREAU MEETINGS MORE ATTRACTIVE.—Mr. Brennand read the following paper on this subject:—"Though it is pleasing to note that our Branch has been fairly successful and that we usually have good meetings, thanks to the energy of our members in bringing forward subjects for discussion, nevertheless, I feel sure we can do still better. My object in writing this paper is chiefly to point out a few defects. Though it is not gratifying to be told of our shortcomings, it is good to know them, in order that we may rectify them. In the first place regular attendance and punctuality at the meeting-place is most important, if we wish to have a good meeting. It is a source of annoyance to both chairman and Hon. Secretary to have to wait a length of time for members to turn up, or, in the case of members coming late, to have to go over part of the work a second time. This could be easily avoided if members would be punctual. Talking while another member is addressing the meeting is bad form, and distracts the attention of other members from the subject. It is also very trying to the chairman, who, perhaps, is unwilling to call the offender to order in case offence may be taken, though he would be quite justified in so doing. I think it is the duty of every member to rise when about to address the meeting. We all know that to remain seated when speaking is a serious breach of the laws of civilised society. We can always excuse a person suffering from any infirmity, but for able-bodied farmers it is inexcusable, and should not be tolerated during the business part of the meeting. It is said that an ounce of practice is better than a pound of theory, and I am convinced that if we in our discussions look well to the practical side and avoid much of the theoretical part we shall get to the point in much less time. It will be a distinct advantage to us, situated as we are, to have an Annual Congress of Branches on the West Coast. In addition to this, I think it would be to our mutual advantage if members made a practice of visiting neighboring Branch meetings, and receiving visits from them occasionally, in order to get into touch with many important questions or Bureau business, as the case may be." Members agreed that meetings could be improved if the advice given in this paper were followed.

CLEANING WHEAT.—A general discussion on this subject took place. Some members were of opinion that it did not pay to go to any trouble in cleaning wheat, as buyers did not offer any better price for a good clean sample than for one of medium quality. The majority of those present, however, thought the wheat should be cleaned as well as possible in one operation with the winnower. If the winnower was properly set and ordinary care taken a good sample could be made.

Koppio, April 22.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), Newell, Brennand, G. and M. Howard, Thompson, Barraud, F. and R. Richardson (Hon. Sec.), and one visitor.

HAY CROPS.—Discussion took place as to whether it was an advantage to sow rape, lucerne, or vetches with the hay crop, so as to have a growth after it was cut. One member had successfully tried rape; others recommended lucerne or vetches.

MANURING.—The question of heavy manuring was discussed, and also the best time to apply fertilisers. Some members favored heavy dressings, because of the increase of feed from the land when left out of crop. The Chairman thought it would pay to put on half the manure at seeding time and half when the heavy rains were over. Top dressing with super. in September had been tried in the district with very good results. Mr. Brennand wished to know whether dry ploughing would be advisable in this district, or whether it would induce takeall. The Hon. Secretary had tried it on two occasions, and had seen no difference in the crop on land ploughed dry or on that ploughed after rain. He thought it would be safe if the land could be well worked, and recommended a disc plough for the purpose.

WORKING FALLOW.—Members thought that fallow would be better if well worked, although it had been said by farmers in the district that new land was best left in as rough a state as possible, so as to give the sun and air a chance to sweeten it.

Mitchell, March 26.

PRESENT.—Messrs. D. Green (chair), Ness, O. and J. Green, Jenkins, Molloy, Dorward, McCormack, Vigar, (Hon. Sec) and three visitors.

KILLING MALLEE SHOOTS.—The Chairman read a short paper on this question. Mallee shoots were a great trouble on fallow land, he said, and the only satisfactory way to get rid of them was to grub them. Cutting them off with a short cutter was quicker work, but not nearly so effective. If a farmer had sheep, he would cut the shoots and turn the sheep into the stubble; then as the young shoots appeared the sheep would nibble off the tender sprouts. The more effective way, however, if the stubble could be spared, was to have a good burn. Members thought the rapid growth of the shoots this year was accounted for by the very wet weather experienced. Mr. Ness thought the best way to kill shoots was to cut them and burn them on the stump. Mr. McCormack considered it best to grub them out. Mr. Ward thought it best to have a good burn not later than February, and if cutting shoots would leave about 6in. above the stump, so that the stem instead of the stump would sprout. The Hon. Secretary also thought this last method of cutting the best.

Penong, April 9.

(Average annual rainfall, 12½in.)

PRESENT.—Messrs. Shipard (chair), Bennier, Edwards, Brook, Wold, Olsen, and Oats (Hon. Sec.).

GARDENING.—Mr. Bennier read a paper on gardening in its various relations to plants, manures, &c. He emphasised the need for thorough working to keep the soil in good physical condition, and to conserve moisture. Vegetables should be raised, he said, in plots of ground rather than in boxes of earth, as the temperature was more evenly maintained in the former. It was best not to sow the seed too thickly, as if thinly sown when planting out it was possible to leave some of the soil on the roots, and thus the young plants had a better start. Wood ashes, if kept dry before being applied to the soil, made a most valuable addition to farmyard manure, and the effect of this mixture on some of the green vegetables, tomatoes and others, was surprising. When tomato plants were 8in. or 10in. high they should have a mulch of old chaff about 3in. or 4in. thick. This would prevent them from being scorched. It was astonishing, he said, the number of plants that were in existence the world over, and here he gave figures to show how a total of 500,000 known varieties of plants, great and small, was made up. Gardeners, he said, should make a close study of some of the numerous plants, from the cultivation of almost any one of which a living could be made. Members were surprised to learn of the great number of plants in existence, and thought a good deal more could be done in the neighborhood to improve the homesteads by growing some of the flowers and shrubs.

Petina, March 19.

(Average annual rainfall, 12½ in.)

PRESENT.—Messrs. Penna (chair), D. F. and J. Kenny, Keeley, Goodhart, Basecomb, Newbond, and Souter (Hon. Sec.).

MANURES FOR WHEAT.—The results of tests with various manures and quantities were given by Mr. Wharf as follows:—The plots were sown on May 5th, 1909, on fallow land, the wheat being Federation, sown at the rate of 55lbs. to the acre. The quantity and kind of manure is given, and immediately following the yield for each plot. No. 1.—56lbs. mineral super., 12bush. 2lbs.; No. 2—56lbs. mineral super. and 5cwt. lime, 12bush. 12lbs.; No. 3—56lbs. mineral super., 28lbs. sulphate of potash and 28lbs. nitrate of soda, 12bush. 22lbs.; No. 4—56lbs. bone super., 13bush.; No. 5—no manure, 8bush. 54lbs.; No. 6—56lbs. mineral super. and 28lbs. sulphate potash, 11bush. 38lbs.; No. 7—28lbs. potash and 28lbs. nitrate of soda, 8bush. 56lbs.; No. 8—56lbs. mineral super. and 28lbs. nitrate of soda, 11bush. 56lbs.; No. 9—no manure, 9bush. 10lbs.; No. 10—112lbs. mineral super., 14bush. 4lbs.; No. 11—112lbs. mineral super. and 5cwt. lime, 14bush. 30lbs.; No. 12—112lbs. bone super., 15bush. 30lbs.; No. 13—112lbs. mineral super., 56lbs. sulphate of potash and 56lbs. nitrate of soda, 14bush. 40lbs.; No. 14—112lbs. mineral super. and 56lbs. nitrate of soda, 13bush. 40lbs.; No. 15—56lbs. sulphate of potash and 56lbs. nitrate of soda, 9bush. 30lbs.; No. 16—112lbs. mineral super. and 56lbs. sulphate of potash, 13bush. 50lbs.

Shannon, April 23.

PRESENT.—Messrs. Proctor (chair), Fleming, Habner, Carey, Irons, Vowles, H. Proctor, Gordon, J., M., and M. A. Cronin, W. and H. Glover, W. M. Smith (sen. and jun), L. B. and E. B. Smith, B. and C. Havelberg, and J. J. Cronin (Hon. Sec.).

SEEDING IN THIS DISTRICT.—The Chairman read the following paper on this subject:—“In this district, where we have not much fallow, we have to make up by putting in new and stubble land. In the first place, if leaving out stubble land, as feed is very scarce in this district it will pay any farmer to go over a portion of it with a light dressing of manure—say about 30lbs., and about 30lbs. of oats per acre. The advantage of sowing oats is that the succeeding crop is not so likely to be troubled with takeall. It would also be profitable to grow a few acres of field peas. If you are putting in stubble land I should plough or cultivate, according to the class of the land. Cultivate if loose and if there are not many shoots, but plough if it is stiff land. By getting this done before the heavy rains come it will only be necessary to put in half the seed, say 30lbs., as there is always a certain amount of seed on stubble land. I would harrow this before drilling, as it makes a good level seed bed. If there were newly burnt land which could be sown I would put that in preference to stubble land to get the benefit of the ashes and to save a year's shoot-cutting, which is a big item. To put this in I should favor shallow ploughing the first year—not more than 3in. deep—so as not to turn up too much sour land, as this would not have the time to get the sun and air into it to the extent as it would if left fallow. I should also harrow this before drilling, across the ploughing as much as possible, and then sow with 50lbs. to 55lbs. of seed and from 60lbs. to 70lbs. of manure to the acre. I think this quite sufficient for this district. As this district is only in its infancy, there is not much fallowing. We cannot look for big averages till we get plenty of good early fallow to put in. In preparing fallow land for seed all shoots should be cut off in March and April, if possible. I should prefer waiting to put this in until after a good rain. Then cultivate and drill in with about the same amount of seed and manure per acre, as for the new land. The best wheats to sow in this district are Yandilla King, Federation, Dart's Imperial, and Walker's. It is also a good plan to sow some Algerian oats, as these will always give a cut of hay. Mixed hay is best, in my opinion—half oats and half wheat, cut into chaff for working horses. For pickling the wheat use 1lb. bluestone to 10galls. of water. Dipping into a cask is quick and satisfactory.” Considerable discussion ensued as to the best way to pickle wheat. Mr. Cronin and Mr. Carey considered pickling on a floor was preferable to a tub, as the grain seemed to dry more quickly and was sure to all get wet with the solution. It was also easier to keep the solution at a uniform strength, while in pickling in a tub the solution was liable to get weak or too strong. Mr. H. Proctor always pickled wheat in a tub, as he considered it was much quicker than the other way, especially if a man was by himself on a farm, as is often the case. A whip could be rigged over a cask, and one man could easily manipulate it. Some varieties of wheat, in his estimation, were more liable to smut (bunt) than others. He had found Walker's more subject to smut than any other variety he had grown. Mr. Cronin considered that the depth to plough depended entirely on the class of land. Sandy

land over clay subsoil should not be ploughed too deeply : but loamy land could be worked to a depth of from 5in. to 6in. Mr. Carey was in favor of giving the ground plenty of harrowing, as the more harrowing it got the better the seed bed would be.

Utera Plains, March 19.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), Gale, Chase, Stephens, A. and C. Venning, Hill, R., H., and T. Hornhardt, J. and M. Abrook, Lee, Guidera, Ramsey (Hon. Sec.), and four visitors.

MOTOR POWER ON THE FARM.—Mr. C. Venning read a paper on this subject. Whereas a few years ago, he said, horses were employed to cut chaff and to do various kinds of stationary work, motors of different types had now largely replaced horsepower for that class of work. With a motor work could be done much more quickly and the horses could be used to better effect in other farm work. Recently with a motor-power winnower he had cleaned 2,500 bags of wheat with no trouble whatever. Four men could clean 200 bags of grain per day comfortably, but to get the most out of the plant and keep everything going in full swing six men were needed. With the same engine—one of five horsepower—all the chaff-cutting and corn-crushing for the farm was done. This engine easily worked a No. 4 cutter with a twenty-foot elevator, and put through a ton of chaff per hour. He recommended intending purchasers not to procure too small a plant, as with a small plant and low power just as much attention was needed, and the work took so much longer. He thought it well to have a little more power in reserve than was generally needed. A six horsepower engine and a No. 4 chaffcutter cost about £120, and if properly cared for would last a long time. The petrol engine could be started from cold in a few minutes, and this he considered a great advantage over oil and steam engines. Motors required a certain amount of attention, and should be kept clean and in good order. Given this and a little experience on the part of the man who worked it, satisfaction was assured. Motor vehicles, he continued, are quickly coming into use, and will soon be as common as horse vehicles. He had for some time past driven a motor buggy and preferred it to a horse buggy, especially for long journeys. It was easy to average from 12 miles to 20 miles per hour on anything like a fair road, and cost from 8s. to 10s. per 100 miles for petrol and oil. The buggy was fitted with solid rubber tires, and these were better than the motor-car tires for stumpy roads. With the advent of motor-propelled vehicles it was becoming dangerous for drivers to sleep when travelling with a team of horses, and they would do well to keep on the right side of the road if there was a motor vehicle in the vicinity. Members generally agreed as to the value of motors for farm work, and thought it a very important aspect of the matter that the horses were saved work and could be spared to do other profitable work.

Utera Plains, April 16.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), A. and C. Venning, R., T., and H. Hornhardt, Pulford, Gale, West, Stephens, Chase, Guidera, Hill, J. and M. Abrook, Haines, Ramsay (Hon. Sec.), and five visitors.

FARMING WITH A SMALL CAPITAL.—Mr. Gale read a paper on this subject to the following effect:—"A young man who intends some day to commence farming on his own account should buy, when possible, a young mare, and breed from her for his future stock of horses. This should not be difficult, as many farmers would keep a mare in return for the work she would do. In this way, and by buying a few foals at sales, a team would be got together in a few years. He had started in this way, and, having an old wagon and reaper, with about £60 capital, he commenced farming in this district. He purchased a scarifier and put in a crop, and at harvest time a neighbor joined in and helped with the reaping. Having bought a winnower, he was able to clean the wheat as it was stripped, and, with the two teams at their disposal, carting was commenced as soon as there was a load. This help on the part of his neighbor saved a good deal of expense, and he was of opinion that a great deal could be done by good neighbors helping each other at the start. One was sure to possess implements or machinery which the other had not, and a few days spent in helping one another should not be looked upon as lost time. In this way a man could start with a little capital, provided that he procured Crown lands, on which the rental was not high. In this part of the State also the soil was not hard to work,"

Members held different opinions as to the amount of capital necessary to commence farming. Mr. Searle could not recommend a young man to start with only £100; he thought £400 would be little enough, and with this view others agreed. The Hon. Secretary thought that if a man went into new country and depended upon his neighbors for help he would be disappointed. He could not recommend borrowing implements, &c., as it was a bad policy. Members pointed out that many necessary items entailing expense had not been referred to in the paper, such as sheds and other buildings, and the provision of water. They recommended iron sheds, because the water from off them could be caught.

SMUT IN WHEAT.—Some discussion on smut (bunt) took place. Mr. Searle had found that wheat pickled before being sown was free from the trouble, and Mr. Hier always grew clean wheat from bleached seed. He recommended taking seed from the last piece of wheat stripped.

Yallunda Flat, March 19.

PRESENT.—Messrs. C. Provis (chair), Allen, Fairbrother, Farnham, J. Wood, and Richardson (Hon. Sec.).

CARRYING CAPACITY OF FARMS.—The following paper, written by Mr. P. Provis on this subject, was read by the Chairman:—"The carrying capacity of a farm is an exceedingly important matter, and one which it is safe to say is not generally understood. On some farms more sheep are kept than ought to be, while on others there are too few. If a farm is overstocked the results are in every way very unsatisfactory, for not only are the sheep kept in anything but good condition, but at shearing time the clip is usually disappointing. On the other hand, it stands to reason that to carry 200 sheep where 300 could be kept is bad policy; therefore, the happy medium is the object to be attained, but what is the happy medium? This has always been a very difficult question to answer. Before fertilisers were introduced the carrying capacity was more easily defined, as the season was practically the only thing to be taken into consideration. Since the use of the fertilisers, however, the capacity has been increased, no doubt due to the stimulating effect of the manures on the natural growth on the fallow, for not only is there stubble to feed upon, but the early autumn rains bring up a much more abundant herbage than used to be the case. One other important factor is the growing of catch crops. There is no doubt that this is the right course to adopt, to provide green feed for the ewe at lambing time, for unless the ewe is provided with suitable food she cannot be in a fit condition to properly rear a lamb. Good food could be made for ewes by chaffing straw and mixing it with molasses, or cocky-chaff could be used with advantage. This kind of feeding would only be necessary when the conditions were such that the lambs were suffering from want of green feed. So far as the carrying capacity of the farm is concerned, the farmer must see that when raising early lambs provision is made for them in the shape of early feed. If the season is a bad one recourse must be had to some means of hand-feeding. Until farmers have had some experience in growing such crops as those mentioned, however, it will be well for them to go slowly in the matter of materially increasing their stock. Therefore the answer to the question, what is the happy medium, must be left to the farmer to work out for himself. If he goes slowly and feels his way, the problem will gradually solve itself." Considerable discussion ensued, and members expressed the opinion that these meetings would be more instructive if the young men of the district were to take more interest.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Forster, March 26.

(Average annual rainfall, 10½ in.)

PRESENT.—Messrs. J. Searle (chair), Towill, Whitfield, W. Searle, Luxom, Hayman, Sears (Hon. Sec.), and four visitors.

BY-PRODUCTS OF THE FARM.—Mr. Towill read a paper dealing with the most profitable by-products for the farmer on the back blocks of the Murray to consider. They were

not in a position to keep sheep, he said, nor could they go in for dairying to the extent that was possible in the more favored districts. In addition to the lack of feed there was the very troublesome wild dog pest to be considered. Every farmer, however, should keep two or three good cows, so that the farm would be supplied with plenty of milk and butter. The great majority of the cows to be seen in the district at present were of poor quality, being good for neither milk nor beef. What they needed was good, big cows, which would give good milk and plenty of it. The calves from these they could rear instead of knocking them on the head, as some farmers in the district did at present. When done with as milkers, such cows would be gladly bought by the butcher, whereas it was practically impossible to get a price for the small mongrel animals frequently met with at present. Practically every farmer kept some poultry, but not in such a manner as to make it pay. In the summer months the eggs that were sent to market were in such a condition that the consumer could never depend upon their being even passably fresh, and consequently the number of consumers in these months became very low. This state of affairs should be remedied, and the way to do it was first of all to separate the roosters from the hens, and sell only infertile eggs. These should be gathered every day, and stored in a cold place till sent to market. With other facilities for distributing the eggs they would be bound to bring a much better price than did the article now placed upon the market. [The many egg circles now established in various parts have succeeded in doing this very thing, viz., getting freshly-gathered eggs, bringing them regularly into the market, and raising the price.—Ed.] It was also absolutely necessary for egg production that a better class of fowls should be kept. The best hens procurable should be mated to a strong rooster from a good strain. He had tried the effect of crossing White Leghorns with the heavier breeds of fowls, but it had been a failure each time. Splendid results, however, had followed mating a good Minorca rooster with some of the best common fowls. The White Leghorns were the best of the pure breeds for egg production.

MANURES FOR WHEAT.—In answer to a question as to the best quantity of manure to apply to soils of this district it was stated that where the soils varied very much different quantities would suit different parts. Mr. Searle put from 40lbs. to 50lbs. per acre on his land. Mr. Towill found from experiments that unmanured land yielded 6bush. of wheat per acre; land with 56lbs. of super. returned 8bush.; and that which was treated with 1½cwt. manure gave 16bush. of wheat per acre. As land was cropped more and more the quantity of manure that was needed increased. Mr. J. Searle used 45lbs. to 50lbs. per acre, and reaped on an average 15bush. Mr. Whitfield had tried 40lbs., 60lbs., and 120lbs. per acre, and could see very little difference in the appearance of the crop. He did not reap the plots separately, however, and therefore could not give the actual returns. He wished to know how much manure to put on limestone soil. Messrs. J. and W. Searle thought about 40lbs. per acre would be best.

Murray Bridge, April 25.

PRESENT.—Messrs. McIntosh (chair), Pulleine, Kuchel, Schottelius, Davie, Taylor (Hon. Sec.), and seven visitors.

LUCERNE-GROWING.—The following paper on the subject was read by the Chairman:—“It is recognised that climatic conditions and variations in soils bring about certain definite changes in the characteristics of plant life. Nearly all of us have at various times introduced seeds which we considered were better than those we already possessed. Many of them gave a good account of themselves for a few years, but gradually they lost their main characteristics and sooner or later their respective identities. Therefore it is only natural to suppose, that after generations of cultivation in different lands, under varying conditions of soil and climate, that under the generally accepted term of lucerne or alfalfa there must of necessity exist plants apparently so far removed from each other in regard to structural form and characteristics as to render it a moot question for debate, even amongst botanists, as to whether they belong to the same family or not. Such being the case, we ask each ourselves the question, ‘Which is the best variety for my district?’ In the past we have generally accepted as gospel the advice, ‘Plant Hunter River,’ but during my past twenty years’ close experience with lucerne I have observed many points in the growth of this variety which satisfied me that either there were several varieties of Hunter River, or the public were paying from 25 per cent. to 50 per cent. more for seed under the name of ‘Hunter River’ than it was actually worth on the market under its true name as ‘French Provence,’

or 'Hungarian,' or 'American.' It is noticeable that our seedsmen will rarely give a written guarantee that the seed they sell as such is actually grown in the Hunter River district, but they are prepared to supply you with the necessary proof that the 'French,' 'Hungarian,' 'American,' or 'Turkestan' seed has been imported direct from their respective habitats. Much of the Hunter River seed is sold through agents, amongst whom there may be those who consider it a fair deal to buy imported seed in Sydney, transport it to the Hunter River district, rebag it there, and forthwith sell at a premium of from 2d. to 6d. a pound. Some years ago, when there was a very limited demand for lucerne seed, we were advised of a shortage of supply of Hunter River, yet now, when the demand for seed has increased by at least 50 per cent., there appears to be an almost unlimited supply available, which in itself is a rather disturbing factor to the would-be lucerne-grower, who is naturally anxious to secure seed true to name without the chance of being defrauded by an excess charge of from 6d. to 9d. per pound. A leading Adelaide seedsman with whom I was discussing the question a few days ago advised me that he had just refused the purchase of a fairly heavy parcel of seed which the would-be seller declared to be Hunter River, but which his general knowledge of seed prompted a refusal, owing to the sample being suspiciously unlike the genuine N.S.W. seed. With the great margin of profit to the seller in favor of the fashionable variety the chances are that the seed in question has been purchased by a less scrupulous agent, who will sell it out as (verbally) guaranteed 'H.R.' In considering the purchase of reputed Australian-grown seed we should, if possible, know something of its origin and from whence it was imported; otherwise when the crop has reached maturity we may, when comparing it with our neighbor's plots, be disappointed with the result. Australia possesses quite a long list of enthusiastic and eminently practical experimentalists in wheat varieties, who not only grow all the best known and most valuable wheats, but cross and hybridise the various varieties, and thus further increase the already long list, with the sole object of securing either a more prolific variety—one capable of withstanding the natural wheat enemies—or one more suited to their particular local conditions; hence in travelling through the various districts throughout the wheat-growing area of the Commonwealth we find comparative local production in many instances holding the pride of place in the annual yield per acre. Yet when we exchange our local favorites with the best from some of these more distant districts the results are in many instances far from satisfactory to either party in the transaction. Still, the fact remains that the originators of the various leading wheats have in the aggregate enriched the general wheatgrowers to the extent of thousands of pounds. In regard to lucerne, apparently until within the last three years no one appeared to consider the necessity of adopting similar practices with the object of securing somewhat similar results in the matter of a substantial increase in our fodder yields. Slightly over two years ago Mr. Elwood Mead, the chairman of the Victorian State Rivers and Water Supply Commission, commenced operations in the direction indicated at Tatura, in the Goulburn Valley, and last year we started out on similar lines on the local Experimental Farm. The varieties tested to date include South Australian, Hunter River, Turkestan, Provence, American, Arabian, and Peruvian. The reason I place the two last-named at the end of the list is because the seed of these varieties is not at present procurable in Australia. With Hunter River, Turkestan, Provence, and American varieties I have had a number of years' experience further up the river, the results of which were to confirm our past season's tests on the farm. One swallow does not make a summer; neither can one season's trials settle the superiority of any given variety. Still, it has served to confirm earlier opinions concerning the merits and demerits of at least the four varieties indicated above. Last July we received tested samples of each of the enumerated varieties, and on August 7th these were drilled in for the full length of the field (over five chains). The soil was some of the best on the farm, and since June 5th 1908, had been cropped as follows:—Oats, sorghum, oats, various grasses, potatos, potatos. The land was then fallowed and thoroughly worked up to a fine tilth with the disc and Acme harrows and roller, and no manure was used. The seed throughout germinated satisfactorily, excepting that the Arabian, which is a much larger seed than the others, containing at least 40 per cent. of waste, and the Peruvian (also an inferior lot), which we estimated resulted in a germination of not more than 85 per cent. With the object of securing a really good stand and giving the plants a fair start, the first cut did not take place until December 14th, when the return throughout proved satisfactory. Immediately after the cut the Arabian asserted its supremacy as the more rapid grower, thus upholding its American reputation as such. The second cut was made on January 27th, when the difference in the various plots became more prominent. Careful weighing tests worked out as follows:—South Australian, 12 tons 14cwt. 4lbs. green fodder, 4 tons 4cwt. 96lbs. hay; Hunter River, 10 tons 13cwt. 96lbs. green fodder, 3 tons 10cwt. 96lbs. hay; Peruvian, 9 tons 16cwt. 85lbs. green fodder, 3 tons 4cwt. 7lbs. hay; Provence,

9 tons 5cmts. 92lbs. green fodder, 3 tons 3cmts. 104lbs. hay; Turkestan, 8 tons 18cmts. 51lbs. green fodder, 2 tons 14cmts. 102lbs. hay; Arabian, 8 tons 10cmts. 68lbs. green fodder, 2 tons 15cmts. 22lbs. hay; American, 7 tons 19cmts. 90lbs. green fodder, 2 tons 6cmts. 29lbs. hay. From this it will be seen that the average crop dried out about three to one despite a big difference in yields. The third general cut was made at the beginning of March, and resulted in a lighter yield throughout, when the same order of precedence obtained. The March floods of alkali-charged water from Rocky Gully and Preamimma Creeks, although effectively checking the general growth of six varieties, proved conclusively that the Peruvian is capable of withstanding excessive watering beyond any of the others under notice. The Arabian suffered the most, and wilted back to the crown wherever it was submerged; the other five suffered to a less extent, while the Peruvian grew throughout and blossomed well. Added to this fact, it now occupies the first place for the coming cut. The Arabian was the first to send up new growth after the submersion, and still maintains its position as the most rapid grower after each cutting. The most desirable point in lucerne value is the proportion of leaf to the stalk, and when taking this into consideration with the other points in arriving at a decision the first year's results should work out about as follows:—South Australia first, Arabian second, Peruvian third, Provence and Hunter River fourth (about equal), Turkestan fifth, and American a bad last. Not only did that variety remain stationary after the March flood, but it was the only plot which contained dodder, there being three appearances of that deadly lucerne scourge. At present the other varieties will average approximately from 18in. to 2ft. in height, while the latter has not yet covered the crown of the plant. Turkestan appears to suffer next on the list through excess of water, yet it continues to give a satisfactory yield per cut. To further test the merits of Hunter River and Turkestan three-quarter acre plots, on as nearly as possible similar land, were planted with the respective varieties in May, 1909. In this case the latter-named variety has easily maintained a substantial lead in value and weight throughout the season. Judging from a close examination of this reputed Hunter River plant, it is either an American seed or else it has been grown from such. At any rate, it certainly does not warrant the difference in price paid for it as "H.R.;" in fact, the difference could with justice be credited to the Turkestan, which actually cost 6d. per pound less. My experience is that American (Salt Lake) seed does not compare favorably in regard to growth with the other varieties on the market as far as the Murray Valley lands are concerned, while, on the other hand, Californian seed holds its own with them. Turkestan is credited with giving more satisfactory yields on a minimum of moisture than the others, and local indications to date appear to substantiate such an argument. I want it clearly and distinctly understood by all that I hold the highest possible opinion concerning the value of true Hunter River seed, grown from imported Provence, Hungarian, Spanish, or Californian, but I consider the public are more than justified in objecting to be gulled into buying ordinary imported European or American seed regardless of variety at Hunter River prices. My recommendation to prospective lucerne-growers is to purchase if possible guaranteed true South Australian or Hunter River seed, but in the event of the necessary guarantee not being satisfactory try Provence, Hungarian, or Turkestan. Do not sow the latter on any but well-drained soil. To be on the safe side in buying South Australian seed, it is desirable, if possible to ascertain the source of the original seed. Hitherto all the local seed which has come under my notice has given most gratifying results. Land intended for lucerne must possess a good drainage to secure anything like successful results. It does not particularly matter as to the quality of the soil so long as it does not contain too high a percentage of clay or alkali. The area should be fallowed at least three months before sowing, the weeds eradicated, and the soil well worked up with a scarifier, disc or Acme harrow and pulveriser, and rolled when ready for the seed. With a properly-prepared seed bed from 10lbs. to 15lbs. of good seed is sufficient to ensure a satisfactory stand. The soil, should if possible, contain a sufficiency of moisture to germinate and carry the plant into its fourth leaf. Harrow lightly or brush the seed in and again roll the land with the object of excluding as much air as possible and securing a firm seed bed. Fall sowing—*i.e.*, in April and May—is the safest proposition, as it permits the seed to get a fair start, while the ordinary winter rain maintains a good root growth and places the plant beyond the danger of a dry October. Should the district prove subject to heavy frosts a nurse crop of barley sown at the rate of not more than three-quarters of a bushel per acre is often a necessity. Land containing any appreciable quantity of saline matter should always be sown in the fall, so that the winter rains may hold back the alkali from the soil surface until early in the summer. In the meantime the plant has secured a fair start, and as it can withstand a fairly liberal percentage of salts—provided always the drainage is good and the soil kept moist—satisfactory crops may be expected. For spring sowing the land should be ploughed early in the winter so as to

permit the sun, rain, and frost to properly weather the soil. Sow as early in September as possible to allow the young plants to become established before the heat of summer. No nurse crop is desirable or necessary with spring sowing. In concluding I might remark that with a view of allowing lucerne-growers generally to test the apparent merits of Arabian and Peruvian, the Minister of Agriculture has ordered half a ton of the former and a ton of the latter. Should the Department be successful in importing the seed, it will be distributed throughout the State to growers in small lots at actual cost price." Mr. McIntosh was heartily thanked for his valuable paper, and a number of questions put were satisfactorily answered, and a general discussion ensued. Mr. Pulleine said the plots of lucerne on his block on the Mobilong reclaimed swamp had been affected with dodder, and he had burnt thistles and spread fresh manure over the affected parts. This had had the desired effect of killing the weed. He considered, however, that if the lucerne were cut continually the weed would be exterminated. The Chairman said dodder was a dangerous enemy of the lucerne plant if allowed to come to maturity. Fortunately it had been detected in its early stage on the reclaimed swamp lands and checked, but it would need watching, as he had seen it make more rapid growth there than anywhere else in the State. Stock carried the seed from place to place. He also warned growers against lucerne tylenchus, which he had seen on the reclaimed lands also. In reply to a question the Chairman stated that lucerne should not be grazed until it had been sown for 12 months or 18 months. He had seen lucerne only planted six months completely destroyed through stock being allowed to graze on it. The crown had been completely eaten away, and the plant, not having sufficient roothold, had died. With ordinary care lucerne would live many years. He knew of an instance at Renmark where a plot of lucerne planted in 1891 was still flourishing splendidly. This was the first meeting of this Branch, and at the outset it was decided to have all the publications received from the Department bound in volumes. [This is a very wise course to pursue. Bound volumes, particularly of the *Journal* with its index, would prove of great value to any Branch for reference.—Ed.].

Parrakie, April 16.

PRESENT.—Messrs. Dayman (chair), Willis, Wittwer, F. and W. Threadgold, O. and C. Heinze, Sowerby, Schmidt, Beelitz, and Short (Acting Hon. Sec.).

SHEEP FOR THE DISTRICT.—A general discussion took place as to the advisableness of farmers in this district keeping sheep. Members agreed that sheep would do very well on this country, but it would be necessary to yard them at night on account of the dingoes.

QUALITY OF BLUESTONE.—After discussing the question of the strength of bluestone sold to farmers for wheat pickle, it was resolved that in the opinion of this branch this commodity should be sold subject to Government supervision and analysis.

Rhine Villa, April 22.

(Average annual rainfall, 10½in.)

PRESENT.—Messrs. Payne (chair), Hayden, Deane, Hecker, and Vigar (Hon. Sec.).

PICKLING SEED WHEAT.—After considerable discussion of this question members were of opinion that in this district it was always best to pickle seed wheat, even if sown on dry land. Half a pound of bluestone to 4bush. of wheat was the quantity most favored. No one had tried other pickles for this purpose.

Sutherlands, April 23.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Snell (chair), Mibus, Dohnt, Byrnes, Broadbent, Doecke, Twartz (Hon. Sec.), and two visitors.

CONSERVATION OF WATER.—The Hon. Secretary initiated a discussion on the question of conserving water. After considering such schemes as Brady Creek and large reservoirs in the hills near Eudunda, members were of opinion that the most satisfactory and permanent arrangement would be found in pumping from the River Murray.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, March 22.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Lewis (chair), T. and A. Jacobs, Kayser, C., I., and G. Ricks, Broadbent, H. and J. Strange, Curnow (Hon. Sec.), and two visitors.

POTATO-GROWING.—Mr. H. Strange read the following paper on potato-growing :— “To prepare the soil, give it a fair dressing of farmyard manure, about 8 tons to the acre, and 10cwt.s. of Excelsior bone manure or bonedust. I believe this manure is the best for potato crops, as it has both forcing and sustaining qualities. Then dig or plough the ground about 10in. deep, work the manures well into the soil, and leave it in a loose state. For early crops in our district begin to plant at the end of July or the beginning of August ; on the hillsides and in the gullies the beginning of September, but finish planting not later than the end of October, unless the land can be irrigated. Cut the sets longitudinally, and so as to have not less than three good eyes in each ; but if for summer planting, plant round or small potatoes, as the hot land would dry up the sets. Then sprinkle wood ashes over the sets till they all have a coat of ash on the cut part. This will prevent them from rotting in the soil, and will encourage growth. Plant the sets with an old spade or dibbler in rows 1ft. 10in. apart, with 14in. between the sets in the row. Just before the potato comes through the top soil harrow the land well, and this will destroy small weeds and help the potato through. When about 3in. high well chop or hoe or work the ground with a horse. Give another light hoeing to destroy the weeds, and mould or bank up the growing crop as soon as it is high enough. Select the best-grown seed. Rough and small samples are poor croppers, having but little vitality. Obtain the seed from another locality, if possible, as a change is best. The best sorts to plant for our district for hillside crops are Pinkeyes, Bismarcks, White Prolifics ; for flats and swamp lands, Up-to-dates, Carmen’s No. 1, Snowflakes, Warriors, or Brown Rivers. The crops should be dug and marketed when the tops wither away. Before I irrigated my potato crops 6 tons to the acre was a good crop, even on the swamp land, but now I obtain 12 tons and more to the acre, even from the hillsides, and I have averaged as much as 20 tons to the acre off special plots. It pays to irrigate, because it requires only the same tillage for a heavy crop as for a small one. About five years ago a representative from an Adelaide firm dealing in agricultural implements, engines, &c., was travelling through a district on the River Torrens, about 16 miles from Adelaide. He called on a farmer to solicit an order from him for some fertilisers. This man had three acres of potatoes on the bank of the river looking very withered through lack of moisture. The representative sold him an oil engine and pump. He irrigated the potatoes, and through the extra crop obtained that season and the following season he was able to pay for a 6½-horsepower oil engine, a centrifugal pump, and a large quantity of piping. There are millions of gallons of water running to waste under our hills and gullies, which could be raised and used profitably on our potato crops. To be a successful potato-grower you must irrigate as well as cultivate.” Mr. Jacobs could not agree that to make potato-growing profitable it was necessary to irrigate. He grew potatoes successfully without irrigation. He always planted 2ft. between the rows. He did not favor ploughing ; he thought digging better. He always dug his own ground, and this year he manured with 4cwt.s. of crude salt and 4cwt.s. of bonedust, and he dug 23 tons from three and a half acres. He agreed that irrigation paid for the summer crop, but preferred to plant one-eye sets rather than those of four eyes. Mr. Ricks preferred digging the ground. He did not think it necessary to plant such large pieces. Mr. Jesse Strange said they had applied seaweed to land without any benefit. Mr. Strange, in reply, said that ploughing was necessary to compete with the trade. He thought two good shoots necessary to produce a big crop.

Clarendon, March 31.

(Average annual rainfall, 33½in.)

PRESENT.—Messrs. White (chair), Hilton, Spencer, A., A. A., H. C., and E. Harper, Shiedow, Dunmill, Phelps (Hon. Sec.), and two visitors.

WOOL PRODUCTION.—Mr. C. Mathews gave an address on this subject and displayed about 50 varieties of wool. He said there were many different classes of wool, and that sheep should accordingly be drafted out before shearing. Sheep should be kept in the best possible condition to encourage the growth of the wool, and when classing only the best wool should be put in the top grade. Many questions were put to and answered by the speaker.

Dingabledinga, April 8.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. Allen (chair), A., F., and Felix DeCaux, Gill, Chenoweth (Hon. Sec.), and three visitors.

VISIT TO MYLOR TYPICAL ORCHARD.—Instead of the usual meeting members visited this orchard. They were very impressed with the regularity and symmetry of the various fruit trees. Some of the numerous varieties of apples which were new to the visitors were favorably commented upon, and members desired to obtain some wood for budding and grafting next spring. A plot of English nuts showed very vigorous growth, and members thought they would make a good shelter for fruit trees if grown in their own gardens.

Gumeracha, April 18.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Porter (chair), Moore, Randell, Cornish, Bond, Stephens, Lee (Hon. Sec.), and one visitor.

FODDER CROPS.—An interesting discussion followed the reading of Mr. Pearson's (Meadows) paper on this subject. Mr. Bond said growing maize for dairy cows seldom gave good results, as there was too much labor attached to it. Mangolds were a good fodder for cows and pigs. Big crops could be grown on good soil. For growing lucerne he considered sandy soil the best. Sowing on black, heavy flats would be a failure. Mr. Randell said lucerne was a failure on flats, as it could not stand the water in winter. He believed that lucerne hay was more nutritious than other kinds. He had grown mangolds up to 14lbs. in weight; 50 tons per acre was a fair crop. It was necessary to use plenty of manure and to work the ground well. He had also grown big crops of maize, but found cows lost flesh on it. Maize should be turned into ensilage to get the best results from it. He thought feeding to increase the cream would also increase the milk flow. Mr. Cornish said that lucerne hay mixed with oaten hay made splendid feed. Lucerne did best on dry, loose, soil. He had grown maize, but it involved too much labor when feeding a large number of cows. Mr. Moore thought applications of lime to the land would be of great benefit. He said that £12 10s. would have to be expended to grow one acre of mangolds, but if 80 tons were secured it would pay well. He had grown enormous crops of maize. Cows were very fond of this fodder, but it would not keep them in condition.

Hartley, March 28.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Tydeman (chair), Hudd, G. and T. Phillips, Paech, Pratt, and Birmingham (Hon. Sec.).

THE CARE AND TREATMENT OF FOALS.—A paper on this subject, written by Mr. J. Stanton, was read and discussed. Owing to the demand for horses at the present time, there was a tendency to breed from practically any mares. This, he considered, to be a mistake. Suitable mares should be mated to such stallions as would produce stock for which there was the greatest demand of all. It was very important to give the mare proper attention and plenty of feed when the foal is sucking, as it was absolutely necessary that the foal should be kept growing. When the mare would no longer supply sufficient milk to keep the foal growing it should be taken away and be hand-fed. Before taking it from the mare, however, he thought it well to feed them together for a time, so that the foal would learn where the feed-box was and become accustomed to it. When weaning the foal he would let it suck a few times after the mother was taken away, as this seemed to satisfy both mare and foal, and neither would fret over the parting. He would handle the foal as soon as possible after this and teach it to lead and tie up. When handled in this way while foals colts 3 years old could be caught and would follow as soon as the rope was placed round their necks. Lifting a foal's feet from time to time saved a lot of trouble when the time came for it to be shod. These and other things, such as cleaning down the coat, would accustom it to what followed later, but too much petting should be avoided. A good discussion followed. Members did not believe in letting the foal suck when once it had been taken from the mare. They also thought it should be handled from the time it was a few weeks old.

Longwood, March 26.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. Hughes (chair), J. and W. Nicholls, Doley, Oinn, Glyde, Vogel, Pritchard, Coles (Hon. Sec.), and two visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. E. W. Pritchard. The orchard was laid out on the hillsides, sloping in a north-easterly direction, so that the trees were well sheltered from westerly winds. The soil on this side of the range was deeper and richer than that on the slopes facing the sea. A row of Cleopatras and Dunn's Seedling apple trees was particularly beautiful and clean, and the visitors were informed that an underground drain close to these trees had been responsible for their healthy condition. After partaking of refreshments provided by the hostess the business of the Branch was attended to.

CLEARING UNDERGROWTH.—Mr. Coles said he had grubbed some thick undergrowth on his property, and wished to know whether it would be wise to leave it lying on the ground till next summer, so as to break the force of the winter rains. Members thought that apart from the risk of fire the soil would be most benefited by exposure to the sun. They therefore advised him to dig the holes for the trees and burn the rubbish in them. Flood waters, they said, should be carried off by drains.

SPRAYING PROBLEM.—Mr. Oinn wished to know the effect of boiling Burgundy mixture. When he poured hot water on the bluestone and soda a sediment was formed instead of a clear liquid, but when he boiled the mixture it became quite clear. He wished to know whether the chemical action was the same in both cases. [If the bluestone and soda were dissolved separately by boiling and mixed when cold there would be no difference in the solution. If, however, they were boiled together or mixed when nearly boiling it is possible that the mineral matter would settle more readily.—ED.]

PEARS ON QUINCE STOCKS.—Members of this Branch are satisfied that pears on quince stocks produce fruit equal in color and flavor, if not superior, to those grown in any other way.

EXHIBITS OF FRUIT.—Mr. Oinn tabled a Rome Beauty apple, true to type in tint and eye, but exactly the shape of a pear. Two pears were growing near this apple tree. Mr. Pritchard also showed a pear-shaped apple from a Dumelow Seedling, but in this case no pears were growing near by.

Port Elliot, March 19.(Average annual rainfall, 20 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Welch (chair), Vince, Green, Pannell, Brown, and Hargreaves (Acting Hon. Sec.).

TOO MUCH RAIN.—Members reported that much damage had been done in their gardens by the very heavy rains. Near the coast about 5in. had fallen, but a few miles back the fall had been from 9in. to 11in. in four days. Orchards and potatoes suffered considerably. Mr. Green had lost 30cwt.s. of sultanas through the wet.

LUCERNE FOR SHEEP.—The Chairman mentioned that from one acre of this fodder a friend had fed 50 sheep for a considerable time, equal in fact to 10 sheep per acre for 12 months.

USES OF PEAS.—Members considered that in this district, as elsewhere, peas were a good change crop for the land and did well. There were some very heavy crops this year, and the farmers fed pigs, and topped up sheep and cattle with them. One farmer sold five young steers to the local butcher for £50; the animals had been topped up on peas and the meat had a splendid rich flavor.

Uraidla and Summertown, April 4.(Average annual rainfall, 42 $\frac{1}{2}$ in.)

PRESENT.—Messrs. R. N. Cobblewick (chair), F. Y. Cobblewick, Collins, Harfield, Hoffman, Mould, Hart, Hawke, Rowe, Gore, Johnson, Dyer, Kessell, and Snell (Hon. Sec.).

ANNUAL MEETING.—This being the annual meeting, the Hon. Secretary submitted his report. There had been 11 meetings held, with an average attendance of 12·5 members. Papers had been read and discussed on "Apple-growing," "Manuring," and "Oil Engines." Other subjects discussed were—"Destruction of Bird Pests," "Potato Disease,"

"Manure for New Land," "Selling Vegetables by Weight," "Lucerne-growing," "Water-proof Oilskins for Agriculturists," "Standard Fruit Case," and "Worms in Horses." The Conference of Hills Branches had been held under the auspices of this Branch at Uraidla.

SPRAYING FRUIT TREES.—Following on a discussion on this subject it was stated that members had now, as the result of experience, much more faith in spraying than they had formerly, and that they intended to do a good deal more of it in the future as a consequence.

SOUTH-EAST DISTRICT.

Kalangadoo, March 12.

PRESENT.—Messrs. Crouch (chair), Earle, McColl, D. and S. Tucker, Osborne, Rake, Riddoch, Ellison, Gibb, Guerin, Boyce, and Sudholz (Hon. Sec.).

STOCK AND LAND.—A paper on this subject was read by the Hon. Geo. Riddoch. After speaking of the measures necessary to the development of a large, new country, the paper proceeded:—"It is almost beyond conception, but nevertheless a fact, that within 80 years of the introduction of sheep into Australia there are nearly 100 million of that class of stock on this continent. This was the largest number of sheep ever recorded as running in any country, old or young. In addition, there were many million cattle and horses, and these vast stocks and herds, taken as a whole, excelled in quality anything I have seen in the many countries visited. Thinking over the causes leading up to such a condition of live stock, I have come to the conclusion that out of the comparatively small number who came to Australia in the early days, it was the more hardy and enterprising who went into the wilds or the bush and commenced stock-raising. All the conditions being new and the risk of life great, the pioneer's original intelligence was quickened in many ways. With faculties so developed, when the stocks and herds increased and their returns were considerable, they found themselves able to pay higher prices for stud animals of a class that would still further increase the value of the returns from their flocks and herds, and the wealth of the country generally. It has no doubt surprised many that it is wise for a man owning, say, 20,000 sheep to pay hundreds or even a thousand pounds for a single ram. But we know that by judicious use of such animals the clip of wool from the whole of the flocks of sheep could be increased, and that the value per pound could be increased so that the total value of a clip from 20,000 sheep could be increased to the extent of from £1,000 to £2,000 annually. This was a big incentive, and led to Australian sheep being raised to a point that made the return greater than that obtained from sheep in any other part of the world. Although the return from the use of high-class cattle and horses was not so immediate, it came, and assured a good return on the extra capital invested. Before we knew that we could produce wheat that would hold its own against all competitors Australia had long held the premier position as a wool-growing country, and this industry was the main means of creating the wealth which led to our present prosperous condition. The greater the interest the owner takes in his stock the greater pleasure he derives in noting the improvement brought about by his own intelligent application of the knowledge he has acquired. In such a vast extent of country, with such varied conditions, it is not possible to lay down any hard and fast rules for the management of stock. The rainfall in the area used for stock-raising varies from 5in. to 35in. In the one extreme conservation of water is the great necessity, and in the other sometimes the getting rid of it, as is the case in this district. I have had experience in the two extremes, and, although the heavy rainfall has its drawbacks, it is much to be preferred to droughty conditions. In districts with a light rainfall the feed that grows is much more nutritious than the wet parts, where the natural salt and other health-giving properties in the soil are dissolved and washed away. I have seen the common saltbush of the dry interior grown near Adelaide, and it has lost much of its saline property, and again in this district, where the rainfall is still heavier, and there is no salt left in the soil. Even in the South-East district the rainfall varies from 20in., in the Tatiara district, to 32in. in the southernmost part. And the health of the stock is generally better in the first-named district, although the heat is greater

and vegetation more scanty. When I came to this district the population was small; we had no macadamised roads and very few fences, the only enclosures, being small paddocks on the various holdings to keep the working horses, bullocks, and cows: all the sheep were shepherded, and the ordinary herd cattle allowed to run at large. The country generally I think was more healthy, except on the coast lands, where sheep could only be kept for a limited time. One trouble we had then, which was got rid of by judicious treatment, was 'scab.' Many people thought this disease could not be eradicated by external treatment, but this proved to be a mistake. A gentleman now alive (Mr. H. T. Morris, then Chief Inspector of Stock) was one of a very small number who believed it possible to eradicate this scourge by dipping, and I remember well the careful directions he gave me for the mixing of the dipping fluid, which consisted of Virginian leaf tobacco and sulphur. Footrot was another serious trouble in some parts of the district, mainly due to the shepherding and yarding of the sheep, and is a less evil now in consequence of the sheep running at large. I have, however, found in some cases an increase in this trouble, caused by sheep camping under certain trees in a paddock in the summer where there is an accumulation of heating matter, which is calculated to induce footrot. When I found that was the case I had these favorite camping places cleared up, and scattered lime on them. This should be done every year. The amount of matter to shift after the first cleansing is small; the lime is applied annually. The result has been most satisfactory. About 45 years ago I started giving stock coarse salt, which, after a time, they took readily. After the lapse of some years I recognised that something more than salt was necessary, and after consulting with some people with a greater knowledge than I had, decided that iron was what was wanted, and that in the sulphate form was best. The salt being given in troughs, the sulphate of iron, which is in comparatively small crystals, was mixed with it in the proportion of 1lb. of iron to 10lbs. or 12lbs. of salt. The quantity of the mixture taken averages, as nearly as possible, 1 ton for each 1,000 sheep per annum, and has proved most beneficial, improving the health of the stock, reducing the death rate, and increasing the weight of wool. I was not altogether satisfied with the salt and sulphate of iron, and searched round for something that could be given with the salt and iron that would be more likely to reach worms in the intestines and lungs, and came to the conclusion that turpentine was the best thing to give, thinking that the craving for salt would overcome the natural dislike for the strong smelling turpentine. After giving it a long trial, the attempt to induce the sheep to take this was given up as hopeless, much to my regret. Some years ago I met a gentlemen interested in stock in Queensland, who told me that sheep took the salt with turpentine in it. So I started my experiment over again, putting at first only a very small quantity of turpentine into the salt. The result for some months was the same as in the former occasion, and if I had not been told that the stock did take it in Queensland, I might have given it up again; but that knowledge prompted me to think that in time the craving for salt would assert itself, and that the stock would take it, with or without turpentine. This surmise proved right, the salt and iron with the added pint of turpentine now being taken readily, with results that have much surpassed my expectations. My sheep do much better, grow to a greater size, cut more wool, and the death rate is less. Amongst other things I find necessary to improve the health of the stock in this wet district is to drain off as much of the surface water as possible, and also to let daylight in by removing useless timber and particularly in clearing up fallen trees, which serve as a cover for parasites. I have also found it a great advantage when clearing to get the ashes from the heaps scattered as far as possible, say with a long-handled shovel. This supplies a fertilising element in the shape of potash [Also lime.—ED.], and also secures the growth of grass at once where the heaps were burned, instead of only moss for many years after the burning. This is a system which might be applied with even greater advantage when land is cleared for cultivation, as we all know that where heaps of wood are burned prior to cultivation there is a rank growth of straw but little grain. If the ashes had been scattered it would have improved the crop on the area over which they were spread as well as on the patch where the wood was burned. One other matter I have proved is the great advantage of supplying stock with pure water from wells, instead of allowing them to drink at swamps polluted in so many ways, and in which the germs of disease exist. When swamps are too deep to drain I usually fence them to prevent the stock from getting to the contaminated water. Cultivators are teaching us many lessons; amongst them is that by the use of fertilisers better crops all round are grown, and further, that land that at one time would not give a return to cultivators can now be used profitably, and poor land as well as rich will, after phosphate are used, grow more grass and be much more healthy for stock than it was before. I consider that, in a smaller way, the farming community should do what the large holders did, that is, keep nothing but good stock,

which would not only give them pleasure to own, but much greater profit." In reply to a question, Mr. Riddoch said he gave his sheep about a pint of turpentine to a hundred-weight of salt.

POTATOES.—Mr. Osborne tabled samples of potatoes, grown on his farm, of the following varieties:—Planters, Pinkeyes, Italians, Peach Blossoms, Up-to-date, and Redskins. The Planters and Pinkeyes were said to be the best yielders under local conditions.

Kalangadoo, April 9.

PRESENT.—Messrs. McColl (chair), Earle, McDonald, Rake, Osborne, J. and R. Boyce, Morris, Bennett, Tucker, Ellison, Hunt, jun., and Sudholz (Hon. Sec.).

EXHIBITS OF FRUIT.—Mr. Earle tabled samples of well-grown Five-Crown Pippin apples grown by himself. Mr. Ellison showed some immense peaches of beautiful quality, but unfortunately the name of the variety was unknown to those present. Several varieties of apples were tabled by Mr. Sudholz, viz.:—Jonathan, Cleopatra, Dunn's Seedling, Emperor Alexandra, and Cornish Aromatic.

Keith, April 2.

PRESENT.—Messrs. Lambert (chair), Aberl, Fulwood, Farrant, Williams, Godlee, Lock-Dall, Makin, Tyner, and Draper (Hon. Sec.).

WHEAT-GROWING.—A general discussion on wheat-growing took place. Members were of opinion that in this district it was not wise to sow until after the first rain fell, and that June was the best month of all for seeding. It was considered that deep ploughing was best for the local soils, and that from 70lbs. to 100lbs. of super. per acre was the most beneficial quantity to apply. Mr. Makin thought it best to drill in 40lbs. to the acre with the seed, and another 40lbs. per acre about six weeks later.

Lucindale, March 19.

(Average annual rainfall, 22½in.)

PRESENT.—Messrs. Rayson (chair), Carmichael, Dow, Langberg, Tavender, Rivett, T. W. G. and W. M. Secker (Hon. Sec.).

POTATO-GROWING.—A paper written on this subject by Mr. J. McMorron was read. It was to the following effect:—Having selected a suitable piece of land, it should be well ploughed to a depth of from 1ft. to 18in. in, say, the month of April, after rain. About two months later a thorough working with a spring-tooth scarifier or similar implement should follow. Carefully selected seed of good size should be cut into sets and planted about 16in. apart with from 24in. to 30in. between the rows. He would use a single-furrow plough for planting, as with this implement it was easier to make a straight furrow, and this was important for the later workings. About two or three weeks after planting he would harrow. Leaving the soil fairly open for the first few weeks allowed free access of air, and prevented many of the seed from rotting. Three weeks later they could again be harrowed without doing any damage to the young plants. Every two or three weeks after this with a single-horse scarifier the soil between the rows should be worked, the first time with the hoes on the implement, and after that with the mouldboards in position to earth up the plants. Coarse weeds could be cut up with a hand hoe. In this district the best time to plant was September. Some growers sprinkled manure in the rows by hand; others had an attachment to the plough worked by a chain or belt from the wheel, but he considered the best way was to drill a good quantity of manure into the land just before planting. Any manure not taken up by the potato crop would benefit the succeeding green crop. If the land was properly worked, potatoes and greenstuff could be grown alternately for many years on the same ground. In the discussion which followed, Mr. Rivett said he had applied potato manure as a top dressing without any apparent result. He was convinced that thorough working was absolutely necessary for the best returns. Mr. Tavender thought the best way was to drill in the manure. Mr. Secker had seen in the Millicent district a splendid contrivance carried on the plough by means of which the manure was deposited in the furrow where the potatoes were to be sown. In this way the full benefit of the fertiliser was obtained by the crop of tubers.

Mount Gambier, April 9.

(Average annual rainfall, 31½ in.)

PRESENT.—Messrs. Sassanowsky (chair), Smith, Holloway, Major, Bodey, Pritchard, Ruwoldt, Watson, Sutton, Keegan, Dow, Kilsby, and Collins (Hon. Sec.).

DODDER ON LUCERNE.—Mr. T. Millhouse had left with a member of the Branch a bunch of lucerne thickly intertwined with a parasitical plant which most of the members pronounced to be dodder. To get rid of it some advocated plenty of salt. Mr. R. Smith said the only way to effectually clear it out was to cover the patch with chaff or something else that would burn slowly, and burn it out. He got rid of it that way. Of course, the lucerne and everything else was killed by the burning; but that was the best way of getting rid of the dodder, and it should be done soon. The sample was forwarded to the Secretary Advisory Board for absolute identification. [This is dodder. The best treatment is that recommended by Mr. Smith.—ED.]

RICH AND POOR LAND CROPS.—In further discussion of this subject Mr. R. Smith thought grasses grown on good land were superior to those grown on poor land. Stock fattened on rich pastures around Mount Gambier were better than stock fattened on poor land. He was of opinion that chaff grown on good land weighed half as much again as that grown on poor land, while Mr. Holloway was just as certain it did not. He believed straw grown on good land grew too rank, although there was more of it, and it had less grain in it than that grown on inferior land. Mr. A. Dow believed anyone wanting to fatten stock, and having a choice, would select good land; and he thought that a certain amount of feed from poor land was not so good as the same quantity from rich land. He considered that cereals or grass from good land was better proportioned, and therefore better for the animals as feed. The straw from the poorer land might be as sweet, but it did not fatten as well. Mr. Bodey thought that the grass and cereals off the poor land was 30 per cent. better than the hay off the rich land. In rich land the crops were too heavy and coarse, and there was a lot more flag on them. Grass grown on rich land was superior to that on the poor land. Mr. Kilsby had some land at Red Camp; it was sandy country, and the lambs from there and fat sheep invariably "died" splendidly, as the butchers say. Cattle also fattened there turned out well; but if they went into poorer country still further on they could not get them fat. They looked well to the eye, but did not turn out well when slaughtered. There was less fat on the kidneys, &c. He thought that oat straw from his Red Camp country was better than that from his Moorak property; it grew rank at Moorak. Mr. Ruwoldt found that a heavy crop from rich land was far superior to a crop from poor land. If manure were used the grass and hay grown on poor land was better for stock. Mr. Bodey said the question was whether a ton of stuff from rich land was better than a like quantity from poor land. He did not think Mr. Colebatch or anyone else could say that a crop 6ft. high was equal in quality to one 2ft. or 3ft. high; therefore he said the crop from poorer land was better than that from rich land. It had more head in proportion to the straw. Mr. Sutton said that as far as his experience went the hay they grew on the stiff red soil with clay bottom was much better for horses than that grown on the light land. He thought the stiff red soil with clay subsoil was ideal land for growing fodder. By a majority of one the following resolution was carried:—"That this meeting considers that there is more nutrient and fattening qualities in cereals grown on rich land—that is, land capable of growing 3 tons per acre—than on poor land capable of growing only 1½ tons of hay per acre."

AGRICULTURAL PUBLICATIONS

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

Pruning of Fruit Trees, by G. Quinn, 1s. 3d.; posted, 1s. 7d.

Vinegrowers' Manual, by A. Sutherland, 6d.; posted, 7d.

Reports of Conferences of Australasian Fruitgrowers held at Brisbane and Wellington, 1s. each, or 1s. 3d. if posted.

Journal of Department of Agriculture of South Australia, 1s. per annum, in advance; 3d. per copy.

Any of the following Bulletins and Leaflets may be obtained by sending a penny stamp for postage:—

Agricultural Miscellaneous: Milling Characteristics of Australian Wheats; Semi-arid America—Its Climate Compared with that of South Australia; Agricultural College, Roseworthy—Harvest Reports; Agricultural College, Roseworthy—Reports on Permanent Experiment Field; Rust-resistant Wheats; Reports on Agricultural Experiments; Noxious Weeds; The South Australian Wheat Yield, Season 1907-8; Improvement of Cereals; Dry-farming in America; Congress Reports; Lucerne Hay; House-building in New Districts; The Amount of Spirit which can be Extracted from a Ton of Raisins; Irish Potato Blight; An Enquiry into South Australian Conditions; Milling Characteristics of South Australian Wheats; Bunt Tests.

Chemistry and Soils: Soil Surveys; Available Plant Food in Soil; Reclamation of Land.

Horticulture: Select List of Fruit Trees; Preserving, Canning, and Drying Fruits; The Lemon in Sicily; Defects in Export Apples; Apple Mussel Scale; Some Notes on Almonds; When to Apply Bordeaux Mixture; Fruit Flies; Fruit Maggot-fly Pests; The Codlin Moth; Fruit-drying for Beginners; Fruit-drying in California; Banded Pumpkin Beetle; Bordeaux Mixture and other Fungicides.

Stock: Stomach and Bowel Disorders of the Horse; The Branding of Stock; Review of the Wool Season; Bot-fly; Worms in Horses.

Dairying: Taints and Flavors in Dairy Produce; Milking of Cows; List of Dairy Factories; Instructions for Milk and Cream Suppliers; Spaying of Cows.

THE JOURNAL

OF THE

Department of Agriculture OF SOUTH AUSTRALIA.

No. 11.

JUNE, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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“The Editor, Journal of Agriculture, Victoria Square, Adelaide.”

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J. P. WILSON,

Minister of Agriculture.

POINTS FOR PRODUCERS.

The Department of Agriculture.

The compliment that was paid to the Department of Agriculture by the Peake-Butler Government in giving it a Minister entirely to itself has been practically repeated by the new Premier (Mr. Verran) in his allotment of the portfolio of Minister of Agriculture and Industry to the Hon. J. P. Wilson, M.L.C. It is a matter of satisfaction to the officers that the growing importance of the department has been so recognised, because it is a distinct



HON. J. P. WILSON, M.L.C., Minister of Agriculture.

help to the speedy and successful carrying on of their work to have a Minister who has not to devote the bulk of his time to another large department. Mr. Wilson has always taken a keen interest in the agricultural industry, not only of South Australia, but Australia generally, and so far as his travels enable him to speak he knows of no better cereal or fruit-producing country

than this State, and he holds the opinion that in both these lines we should lead the Commonwealth both as regards quality and quantity. No effort will be wanting on his part to help the State retain her reputation as a holder of world's championship prizes in wheat, apples, and butter, and to encourage every branch of agricultural industry, at the same time not forgetting the fact that the consumer must be regarded as a factor so far as economic production is concerned. Those branches of the department which have been established for the benefit of producers in opposition to or in the absence of private enterprise will have his warmest sympathy, and he will not be disposed to give more than due weight to criticism coming from persons interested in rival schemes of trades. The Government Export Department, the Government Butter Factory, and the egg circles system will thus have his strong support, and every facility will be given them for extending their operations, such as by the suggested appointment of inspectors in connection with the egg circles system, part of whose duty it would be to visit various centres and explain the system. Mr. Wilson intends to bring himself into close relationship with producers by attending Bureau conferences from time to time, and by this means obtain first-hand information as to their requirements. The new Minister has taken up the office recently provided in the building at the corner of Flinders Street and Victoria Square, and most of the staff of the department now have offices in the same building.

A New Experimental Farm.

Arrangements have been made with Messrs. Claridge Bros. whereby they have placed at the disposal of the department nearly 3,000 acres of land between Petersburg and Yunta, in the hundred of Minburra, for the purpose of experimental work on dry farming lines. A large proportion of this land, on which there is a nice homestead, dams, and other improvements, has been farmed within the last 20 years. It is too late this season to put any of it under crop except a small portion for hay. The greater portion of the land is cleared, and fallowing operations will be commenced forthwith.

English Tests of South Australian Wheats.

In order to demonstrate the value of South Australian wheat to buyers and millers in England the South Australian Trade Commissioner in London (Major A. E. M. Norton) recently recommended the Minister of Agriculture to authorise the shipment to him of samples of typical varieties, part of the shipment to be placed in the hands of English experts qualified to report on their milling and baking values and the balance to be exhibited at different

exhibitions throughout England. The selecting of the wheat was left in the hands of Professor Angus, who secured representative samples as follows :— From Mr. F. Coleman, Saddleworth, 40 bags of Tarragon, 37 of Pratt's Come-back, seven of Special Comeback, and seven of Jonathan ; from Mr. J. Sandow, Brinkworth, 37 bags of John Brown, 42 of Yandilla King, and 41 of Federation ; from the Roseworthy Agricultural College, 20 bags of King's Red and 20 of Gluyas. Most of these varieties are those generally grown, Tarragon and Jonathan being included as examples of the more recently introduced wheats. The wheat was shipped by the *Agamemnon* on May 28th, and the result of the tests will be awaited with much interest by farmers.

Examination of Stallions.

In September, 1908, the Stock Department, as the result of a deputation from the Royal Agricultural Society to the Commissioner of Crown Lands, inaugurated a system of veterinary examination of stallions. It was made compulsory that all stallions competing for prizes at any show subsidised by the State should hold the Government certificate of soundness. During last year 20 shows were visited by the Government Veterinary Surgeon (Mr. J. F. McEachran) and his assistant (Mr. C. A. Loxton); 244 stallions were examined, 160 certificates were issued, and 62 horses were rejected on account of hereditary unsoundness. It is proposed this season to adopt, as far as possible, the system of holding special stallion parades for the purpose of granting certificates of soundness prior to the holding of shows. A time-table of parades is now being drawn up in collaboration with the various agricultural societies.

Pleuro-Pneumonia.

An outbreak of pleuro-pneumonia has occurred in cattle recently imported from Brighton Downs Station, Queensland; but it is hoped that the prompt action taken by the Chief Inspector of Stock and his officers will result in its speedy extinction. The Queensland mob were uninoculated, and unfortunately 200 bullocks were sold to graziers in various parts of the State before the disease was discovered. Quarantine camps have been established near Bruce (92 head) and at Redhill (85 head), and the beasts have been inoculated. Some of the diseased bullocks were killed, and some others have still to be accounted for; but the inspectors are making diligent search for them, and Mr. Needham does not anticipate any serious trouble.

Tree-Planting on Farms.

The necessity of replacing, to some extent, the lost forests of the world is becoming more urgent every year—in Australia not less than in other countries. In the preface to his "Annual Catalogue of Trees for Free Distribution, 1910-11," Mr. Walter Gill, Conservator of Forests, says—"It matters not whether we regard it from the standpoint of the protection trees afford against the wind, or from that of the grateful shade they provide in the trying heat of the summer; whether we consider their function as factors in beautifying the landscape, or dwell on their great value as producers of commercial lumber—regarded from whatever aspect may be chosen they are a source of ever increasing interest." It is worthy of note that last year the total number of trees distributed amounted to 317,204, the number of applicants for which was 1,996. A thousand catalogues were issued, containing the usual information as to methods of planting, description of trees, and numbers obtainable. Trees have now been issued *gratis* by the department for 28 years, and during that period 36,994 applications have been received, in response to which a total of 7,583,729 trees have been distributed. The catalogue contains directions for planting—a most important subject, if success is to attend the operation—the conditions upon which young trees will be distributed, a list of the seven State nurseries for the guidance of intending applicants, and a brief description of the trees available. It is to be hoped that farmers and others will avail themselves of the liberality of the State to beautify their homes, shelter their stock, and provide a supply of timber for future years.

Pruning.

The Horticultural Instructor (Mr. G. Quinn) writes—"The falling of the leaves is usually taken as a sign of the arrival of the time for beginning to prune most orchard trees, but it is by no means absolute, and unless the grower has a great many trees to prune there is really nothing to be gained by starting this work very early. For instance, newly-planted trees are better left unpruned until the approach of spring, when the buds which are likely to produce strong shoots, and which have escaped damage from diseases and other causes, can be most readily seen. Further, it may happen that accidents from tillage operations will damage portions of the trees, and no alternative branches will remain to fill up the blanks in the frame-work if the pruning be done immediately after planting. As far as trees of a more mature age are concerned there is a distinct advantage to be gained in allowing pruning to remain as late as practicable into the winter, because the differences between flower buds and leaf buds are much more readily detected as the winter advances, and the ravages of different gum-producing fungi can also be more easily perceived. With regard to the treatment of newly-planted trees, the stone fruits, generally speaking, are best trimmed to clean

whipsticks, as displayed in the central stem or leader, and this should be cut back to such a height from the ground as is considered desirable under the circumstances. Before trimming away the side branches the pruner should observe whether base-buds are formed where they join the main stem, and where these are not noticeable the side shoot may be cut back to the lowest bud upon it, which, of course, is nearest to the main stem. The height at which the central leader is cut depends somewhat upon the location; and it may be taken as a general rule that the hotter and drier the locality the shorter should be the stem of the tree. Further, when trees are planted on steep hillsides it becomes necessary to give them a slightly elongated stem, so that the branches on the upper slope shall not too readily sweep the ground when put to the strain of fruit bearing. In localities subject to late frosts stone fruits—such as peaches and apricots—should have a higher stem than in districts not subject to such frosts. In regard to trimming the lateral growths of such fruits as the apple, pear, and plum, which form permanent spurs, all of those which are of reasonable length and project outwards from the main framework of the tree should be preserved, whilst those projecting into the centre should be thinned out, but not necessarily wholly suppressed. In respect to the pruning of the early ripening kinds of peaches, nothing more than thinning out the densely crowded parts should be attempted in the winter season."

Berseem, or Egyptian Clover.

Mr. S. McIntosh, manager of the Murray Bridge Experimental Block, writes—"Re the reference to the fodder 'berseem' in the report of Professor Perkins in the May issue. The remarks of F. G. Carpenter concerning this valuable fodder in an able article of his which appeared a few years ago may be of further interest, particularly to the settlers along the banks of the Murray. He writes—'Egypt raises a great deal of hay, and it produces some of the very best clover. The Egyptian clover is known as berseem. It has rich feeding qualities, and a small bundle of it is enough to satisfy a camel. It is cut and carried into the cities for sale on the backs of camels and donkeys, and it is also grazed. Egypt is a great stock country. For its small size it supports, I venture, as many animals as any other part of the world.'"

Quarantining Districts Affected by Irish Blight.

The Horticultural Instructor (Mr. G. Quinn) writes—"Under the powers of the Commonwealth Quarantine Act the Federal Government issued a proclamation on May 14th, firstly, prohibiting the removal of potatoes and other solanaceous plants and parts thereof from the hundreds of Yatala,

Talunga, Onkaparinga, Adelaide, Port Adelaide, Noarlunga, Willunga, Myponga, Nangkita, Kondoparinga, and Macclesfield, in South Australia, to any part of the Commonwealth in which the disease known as Irish blight (*Phytophthora infestans*, of De Bary) does not exist; and, secondly, declaring that all potatoes and other solanaceous plants and parts thereof in the above-mentioned hundreds shall be subject to quarantine. This course was taken owing to the fact that the State legislation enacted up to the present does not empower the local authorities to quarantine any area affected by any other disease than the phylloxera of the grape vine. As the potato blight has only been located over a comparatively small area of the State, and by no means the chief potato-growing portion of it, it was thought desirable to suggest that the Federal Government be asked to step in and apply the powers conferred on it under the Quarantine Act until such time as amending legislation gives the necessary authority to the State Government. It might be pointed out that in fixing these hundreds certain areas have been enclosed within the quarantine which are not generally affected by potato blight, but the object was to provide a good market for the sound produce which might be raised within the hundreds named. Accordingly the whole of the metropolitan area was included. It may appear that some semblance of hardship has been imposed on growers by interdicting them from sending their potatoes and tomatoes out of this area, but the population included in it can very easily consume all the potatoes produced therein, and as there will be no tomatoes ripe until next summer, there will be ample time to pass the necessary State legislation, and so cause the removal of the existing quarantine by the substitution of another form of quarantine, which may place the districts in a different order, and which may remove the apparent disabilities of the present arrangement."

Is *Euphorbia Drummondii* Poisonous?

Mr. J. M. Black writes—" *Euphorbia Drummondii* is a little native plant with juicy stems lying close along the ground, circular leaves, and numerous small flowers, pink or bright red. It is found in most parts of the State north of Adelaide, and has long been suspected as poisonous. Experiments conducted some years ago in N.S.W. resulted in a verdict of 'not guilty' against Drummond's Euphorbia, but it is questionable whether experiments in feeding animals in enclosed places with plants supposed to be poisonous have always the same effect as is reached under natural conditions. Last month a farmer near Gladstone turned two valuable heifers into a hilly paddock traversed by a creek, and a couple of days later both were found dead, and apparently poisoned. A quantity of *Euphorbia Drummondii* was discovered in the dry bed and along the sides of the creek where one of the animals

was lying, and as this was the only green and succulent plant in that part of the field, it seemed likely that young stock might have eaten it greedily. No doubt when other green feed is available cattle and sheep avoid injurious plants, especially if they have had some experience of them. In the same paddock at Gladstone sheep were depastured at the same time as the two cows, but they continued in good health. In suspicious cases, where *Euphorbia Drummondii* is found near dead animals, it would be well to open them at once and see if the plant has been swallowed in any large quantity. In such circumstances, even if this 'milkweed' is not actually poisonous, its presence might be fatal owing to swelling and fermentation. Bailey and Gordon in their 'Plants Reported Injurious to Stock' say of *Euphorbia Drummondii* :—' This weed is unquestionably poisonous to sheep. It has been observed that when eaten by sheep in the early morning, before the heat of the sun has dried it up, it is almost certain to be fatal. It is seldom eaten to excess except by travelling sheep, and when grass is scarce.' The same authorities say that an infusion of the herb is useful to human beings in chronic dysentery and inaction of the kidneys, and the natives apply the milky sap to cuts and sores, which it quickly heals. Mr. Edward Stanley, Chief Veterinary Inspector of N.S.W., undertook the defence of the plant in the *Agricultural Gazette* of that State for September, 1896. In experiments which he conducted over 56lbs. of the weed was procured fresh and used by weight. This was reduced by evaporation and some dirt. The bulk of this weed was consumed by six sheep in six days without the slightest evidence of medicinal effect; their spirits never flagged, and their normal appearance was of perfect health. The weed was gathered fresh every day and given to the sheep morning and evening by three methods: (1) In the natural state; (2) Chopped into small pieces and moistened with water; (3) Made into a decoction like tea. Mr. Stanley goes so far as to consider *Euphorbia Drummondii* a 'wholesome and nutritious herbage.' His experiments were carried out on Yanko Station in March, 1886. He allows, however, that the plant may, when eaten greedily by hungry animals, cause fatal indigestion, in the same way as might occur from the over-eating of lucerne, green wheat, &c.'

Dry Farming Congress.

It is impossible, says the *Agricultural Journal* of N.S.W., to over-estimate the value of the Dry Farming Congress of America. Beginning a few years ago as the Trans-Missouri Dry Farming Congress, the organisation has now been completed on international lines, having but one object—"The further development of agriculture throughout the world by the utilisation of scientific and sensible methods of conservation and cultivation where irrigation is

impracticable or impossible." At the fourth annual session last year there were official delegates present from two provinces of Canada, Mexico, Turkey, Germany, and Hungary. Eleven hundred delegates were assembled from the states, territories, and nations represented. The Hon. J. H. McColl (President of the Senate of Australia) is Vice-President of the Australian section. The fifth annual session will be held at Spokane, Wash., U.S.A., on 3rd to 6th October, 1910. The Executive Committee desire to enlarge the membership of the Congress in Australia, and invite suggestions founded on Australian experience. The Secretary-Treasurer is Mr. John T. Burns, 407, Temple Court, Denver, Colo., U.S.A.

Fumigating Citrus Trees for Red Scale.

A large and representative deputation of growers of citrus fruits, principally from the Torrens valley, waited on the late Minister of Agriculture (Hon. T. Pascoe, M.L.C.) on May 19th, and requested that the Agricultural Department should undertake the fumigation of all citrus trees affected with red scale (*Aspidiotus coccineus*). It was pointed out by various speakers that while the Government were insisting upon this operation being carried out wherever the scale existed, the difficulty of obtaining the necessary plant stood in the way of many persons doing the work themselves. In the opinion of the deputationists it was not considered desirable that work involving such great care should be left to private contractors. The deputation simply asked that the department should provide the outfit and do the fumigating at cost price. One complaint the deputationists had to make was that while certain orangeries were fumigated, others closely adjoining them were left untouched for a considerable time, with the result that birds and other agencies spread the pest back again from the infected trees into the orchards which had been treated at considerable expense. One or two of the speakers, who have had a long practical experience, expressed the opinion that if the fumigation were carried out on a proper basis the scale could be stamped out, and what was necessary was an organised campaign, which would take each district in turn and fumigate every tree on which the red scale was found. The Minister gave a sympathetic reply, and has referred the matter to the Horticultural Instructor (Mr. G. Quinn), who has reported in favor of the deputation's wishes. Some five or six years ago the question of permitting the distribution of scale-infested fruit came before the Government of the day, and the Horticultural Instructor submitted a plan exactly similar to the one proposed by this deputation. Had the proposal then made been put into practice it is very possible that the work of suppressing the red scale would have been a very much easier task than that which it will now prove to be.

Hardiness of Lucerne.

The annual report of the Dickenson Experiment Station, North Dakota, for 1909, contains some interesting results from tests of the resistance to frost of different varieties and strains of lucerne. This station is on the high plains, where the winters are very cold—during two weeks of the winter of 1909 the minimum temperature ranged from -3° F. to -31° F., and during one week it did not rise above -60° F. Under such conditions, if lucerne-growing is to be made a success the plant must be sufficiently hardy to withstand extreme cold. In the special nursery plots some 68 varieties or strains are being tested. Of these 10 were totally destroyed, less than 10 per cent. survived with 20 other varieties, and with only four strains did more than 40 per cent. of the plants survive the winter. The bests results were obtained from a variety named Grimm, which originated with seed brought from Germany, in 1857, by an immigrant of that name who settled in Minnesota. Of this variety over 90 per cent. survived; while the next best results were obtained from Turkestan, 83 per cent.; and Mongolian, 79 per cent. The experiments carried out at Dickenson have shown that the strains of lucerne received from warm countries, or which have originally come from such, fail to withstand the rigors of the Dakota winter. There is undoubtedly room for considerable work in lucerne improvement. It is quite probable that we will find that the varieties that do best on the Adelaide Plains may not be so suitable for the higher elevations of the North, where heavy frosts during the winter and early spring are frequent.

Imports and Exports of Fruits and Plants.

During the month of May, 6,642bush. of fresh fruits, 29pkgs. of plants, 4,801 bags of potatoes, and 123 bags of onions were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act; 490bush. of bananas, and 40 bags of potatoes were rejected. The exports to inter-State markets comprised 4,809bush. of fresh fruits, 1,983pkgs. of vegetables, and 70pkgs. of plants, also examined at Adelaide. In addition, 2bush. of fresh fruits were examined and passed at Angaston, 89bush. of fresh fruits and 15pkgs. of vegetables at Salisbury, and 424bush. of fresh fruits at Clare. Under the Commerce Act 4,588bush. of fresh fruits, 137pkgs. of preserved fruits, 206pkgs. of dried fruits, and 3pkgs. of plants were exported to oversea markets during the same period. These were distributed as follows:—For London, 350 cases apples and 5 cases preserved fruits; for New Zealand, 370 cases lemons, 209 cases grapes, 2 cases apples, and 3pkgs. plants, also 79 cases preserved fruits and 206 cases dried fruits; for India and East, 2,185 cases apples, 2 cases pears, 4 cases almonds, and 53 cases preserved fruits; for South Africa, 1,466 cases apples. Under the Quarantine Act 2,809pkgs. plants, seeds, bulbs, &c., were inspected and admitted from oversea sources.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

A USELESS WEED.

"G. H. M." Mannum, writes—"I am sending you for identification a weed which is becoming somewhat prevalent in different places around here. I have been wondering whether it is identical with the Lantana pest of New South Wales."

Mr. W. L. Summers replies—"This plant is *Heliotropium europaeum*, a useless annual weed, commonly called potato weed in the North. It has no resemblance to the Lantana."

DETERIORATION OF SUPERPHOSPHATE.

"W. G. T." Truro, writes—"Owing to the dry weather, I shall have a good deal of 38 per cent. mineral super. left on hand, and I am anxious to know whether it will deteriorate. Can you tell me whether it will lose much of its valuable properties if left over until next season?"

The Inspector of Fertilisers (Mr. W. L. Summers) replies—"It is not possible to say to what extent the super. will deteriorate, as a great deal depends on the constituents used in its manufacture. In all probability it will lose in weight by the evaporation of moisture, and a certain proportion of the water-soluble phosphate will change into the less soluble, i.e., citrate-soluble phosphate. With a well-made super., however, this change would not be very great, provided always that the super. is kept dry. Should it become damp at any time, the reversion would be greater. I have had instances where super. has been kept in store for nearly 12 months, and the change has been very little; and on the other hand, I have noted a reduction of as much as from 37 per cent. to 32 per cent. water soluble.

RENEWING LUCERNE.

"Inquirer," River Murray, asks "for the best method of dealing with a stand of lucerne, planted one year, the growth of which does not at all compare favorably with other plots in the same paddock, and sown on the same class of land; evidently an inferior variety of seed."

Mr. S. McIntosh replies—"Graze the area as closely as possible at once, then run the plough or a heavy cultivator with a strong team of horses through it, tearing up a quantity of the plants; follow with a liberal dressing of manure as suited to your particular class of soil; harrow and drill in from 5lb. to 6lb. of what you have reason to believe is a good strain of South Australian, Hunter River, or failing these ordinary imported Provence seed, and then harrow lightly and roll. If the soil is not sufficiently wet to germinate the seed at once, provided water is available, irrigate, if not, wait for rain. In any case the young plants should get a good start while the older ones are dormant. Judging from your description you have some Utah seed (common American), which is not a success on the river, and from press reports it is being superseded in California by the Turkestan variety."

TETANUS OR LOCKJAW IN FOAL.

"Hartley" writes—"I had a foal which I considered died of lockjaw. It was four months old, and he could not open his mouth; it was paralysed in the hind legs (legs quite stiff) and could not bend them. This occurred after a heavy rain and cold weather. I would like to know the cause and remedy, if possible."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.), replies—"The disease tetanus or lockjaw is caused by a germ (common in garden soil, &c.) which gains entrance by means of wounds, especially punctured and bruised wounds. The germs remain at the seat of inoculation (*i.e.*, the wound), and the tetanic symptoms are produced by the toxins eliminated by the germs. Dirty stables, yards, &c., are likely places to harbor the germs of tetanus. In mild or sub-acute cases curative treatment is sometimes successful. All wounds should be cleansed and dressed with a strong antiseptic. The animal should be placed in a dark loose-box, and one attendant only should look after him. Sloppy bran mashes with linseed should be given, and the receptacle should be placed in a convenient position so that the horse can reach it. If anti-toxin can be procured, anti-toxin treatment may be tried; if not, extract of belladonna, $\frac{1}{2}$ drachm to 1 drachm mixed in treacle, should be placed in the mouth every four hours. The affected animal should be kept as quiet as possible. Preventive treatment is simple, and consists in attending wounds and abrasions at once, cleansing and dressing with antiseptics, *e.g.*, carbolic solution (1 in 20), &c. During operations every care must be taken to keep instruments clean, and antiseptics should be used. Stables and surroundings should be kept clean."

"BROKEN WIND" IN HORSES.

"J. A. F." Calca, Beard's Bay, writes—"I have got a good horse (aged), which has a very bad cough. When the coughing comes on the horse is much distressed, and his sides heave very much. He is in good order and

has a good appetite. It has been coming on about 12 months. We use him occasionally; steady work. Would you kindly inform me as to the complaint and how to treat him?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"The horse is evidently affected with 'broken wind.' The horse should be fed with moderate quantities of nutritious and easily digested food, and the water supply should be well regulated. Oaten or wheaten long hay, in moderate quantities, has frequently been found beneficial in cases of 'broken wind.' The horse should not be fed immediately before work."

ANOTHER HORSE COMPLAINT.

"F. V. A." Chain of Ponds, writes—"My horse has a bad cough, and his hair is rough, and he has the appearance of suffering from worms. He coughs day and night (dry, hacking cough), and discharges dark-colored mucus, and has a collection of dirty white around the anus. His appetite is good, eyes bloodshot, yet the hair about his head is smooth and glossy, while on the body it is rough and stands on end. I drove him out about six miles on Wednesday, trotted him downhill, and he started coughing; had to walk him nearly all the way. Kindly let me have an early reply."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"The correspondent does not supply sufficient information as to the length of time the animal has been exhibiting symptoms described. Under the circumstances, I recommend the owner to give the horse a wine-glassful of the following in the food once daily:—Concentrated compound infusion of gentian, 7ozs., added to caron oil, 1 quart, and mix. Full particulars should always be forwarded by correspondents."

GRADING LUCERNE PLOTS.

"Irrigator" writes for advice "re the best method of treatment for his lucerne plots, on which, in places, the soil 'sets' badly after each summer irrigation, and consequently retards the plant growth."

Mr. S. McIntosh replies—"From what I know personally of your 'plots,' they were too heavily graded, *i.e.*, more of the soil than was necessary was displaced in the process, added to which they were laid out practically dead level—an almost fatal mistake, unless with a first-class drainage. I also understand that no manure was used to improve the 'bared' subsoil. First establish an efficient system of surface drainage to get rid of the surplus irrigation water. Graze the plots closely with sheep, at once; then, after the soil is sufficiently moist, cross-cultivate as deeply as is possible with the most suitable implement you may possess or can secure for the purpose. Follow with a dressing of not less than 30cwts. of gypsum per acre, and about a month later—after the latter has been to a certain extent assimilated by the soil—apply a 2in. or 3in. covering of loose stable manure or other

humus on the more heavily-graded portion, and fertilise the balance by an application of 2cmts. of bone super. to the acre through the drill, afterwards harrowing and rolling the area to facilitate a clean first cut. In future, be careful not to irrigate after cutting; but about a week before the bloom shows in the crop, and for preference during cloudy weather or at night. This mode of treatment will materially reduce the 'soil-setting' trouble, minimise the quantity of water required for irrigation, and ensure a much better plant growth generally."

POTTING BUTTER.

"Moonta" asks for a recipe for potting butter.

The Government Dairy Expert (Mr. P. H. Suter) replies—"First, strict cleanliness must obtain from milking to potting of the butter. Churn your cream when it has a nice, mild, acid taste; do not wait a week to churn, otherwise your butter will not keep so well. Churn, say, 48 hours to 56 hours after separating. Wash the butter free of butter-milk, then add, say, 4lbs. of fine salt (best dairy salt) and half a pound of boric acid to 100lbs. of butter, and see that this is so worked into the butter that it is thoroughly incorporated. Now pack away in an earthenware jar. After filling, place a layer of brine on the top, this will prevent the butter from going off and getting tallowy on top, or affected by heat. Renew the brine frequently, cover up and store away in a clean, sweet atmosphere until ready for use."

BUDDING AND GRAFTING OF APPLE TREES.

"P. T." inquires *re* the merits of apple trees which are budded as compared with those which are grafted.

The Horticultural Instructor (Mr. G. Quinn) replies—"As far as the pre-fruiting period is concerned there would be no essential difference if the stocks used in both cases were equally young and vigorous, as they should be in all nursery stocks. The stock is undoubtedly the controlling factor in this matter, as it retards growth and consequently encourages the formation of flower buds when old and mature, but, on the contrary, when the stock is young the top work upon it is stimulated into vigorous growth over a greater period of years to the postponement of fruit production, and usually, but not necessarily, of flower production."

CINCTURING FRUIT TREES.

"F. J. P." inquires whether the cincturing of fruit trees has the effect of increasing their bearing capacity.

The Horticultural Instructor (Mr. G. Quinn) replies—"Apart from the cincturing of grape vines, this treatment, as far as my personal observations go, has been confined to a few instances of orange and apple trees. Australian Navel oranges and Nickajack apple trees are notoriously shy bearers,

and the results of experiments applied to these appear to indicate at any rate that the practice may be of value, but I recommend that those observations be, at present at any rate, accepted with considerable reservation, owing to the limited nature of the trials which have been made. In respect to cincturing stone fruit trees, such as the nectarine and plum, the exudation of sap in the form of gum from the wound is to be feared. This, however, may be to a certain extent remedied by applying a wax bandage around the wound immediately after it is made. There are some varieties of plum trees, amongst which may be included the very popular Green Gage, which, when planted in good soil, will grow vigorously for a number of years and often refuse to bear fruit until 10 years or 12 years of age. Doubtless the vigor displayed accounts for this, but there may be something constitutional in this variety which tends to postpone the period of fruiting. By way of a remedy it is suggested that all cultural observations, such as pruning in winter, manuring, irrigation, and tillage of the soil, be so regulated that a portion of the trees will be subjected to conditions unfavorable for making wood growth, whilst on another portion a cincture may be applied with a very sharp knife just as the trees are coming into bloom. This cincture may consist of removing a narrow ring of bark, say, one-sixteenth of an inch wide, from around the trunks of some, and from select limbs only of other trees. This strip of bark should be taken out down to the sap-layer, and it is suggested that a bandage be applied over the wound to exclude the dry air. The object of cincturing is to create a temporary check in the upflow of the crude sap. The wax band is applied to assist in the healing of the wound and prevent the exudation of the gum."

PLOUGHING PEAS IN.

"H. G. S." Angaston, wrote during the first week of May with respect to the sowing of peas in his orchard, with a view to ploughing them under later on, so as to add humus to the soil.

The Horticultural Instructor (Mr. G. Quinn) replies—"In my opinion you are not likely to make a success of this work in a season of deferred rainfall such as the present. It is necessary to secure a growth sufficient to be able to plough the haulms under while the ground contains plenty of moisture—sufficient to decompose the peas—say in August or early in September. Unless I mistake the possibilities of your district I think even if it rained now the soil temperature is falling so fast that your peas would make little or no headway until about the time when they should be ploughed under. The best successes in raising crops of peas or green manure in this climate have been achieved when, after an early rain, the surface of the orchard has been scarified, and the peas drilled in not later than the beginning of April. The plants under these conditions will have almost completed their growth before the cold and wet of midwinter comes upon them. They

may be then ploughed under in early spring, just as they come into bloom, when enough moisture is in the ground to decompose them rapidly. The common dun or field pea is considered most suitable, and from 1bush. or $1\frac{1}{2}$ bush. should be drilled in with not less than 1cwt. of superphosphate to fine bonedust to the acre."

DESTRUCTION OF TAPEWORMS IN HORSES.

"Belalie North" writes—"I would like information as to how to destroy tapeworms in horses."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"Tapeworms in the horse can be easily removed by treating with oil of turpentine and raw linseed oil. The horse should be fed with bran mash at night, and the next morning he should be drenched with $1\frac{1}{2}$ ozs. of oil of turpentine in 1 pint raw linseed oil. One drench is generally sufficient to remove the worms. Re remarks by the Hon. Secretary that he was not aware that cows suffer from 'tapeworms,' they are found in horses, cattle, and sheep."

FORMALIN AS A GERMICIDE.

"Emerald" asks how formalin is used in lieu of bluestone, and in what quantities.

Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S. (Acting Principal of Agricultural College) replies—"Formalin is an efficient germicide, and it has been abundantly proved in the experimental plot and in the farm paddocks that when properly used it will destroy the spores of smut and bunt without seriously affecting the powers of germination of the seed. Like bluestone, however, its reputation has suffered from the carelessness and ignorance of those in charge of the pickling process. It is by no means a perfect pickling agent, nor for that matter is bluestone, or any other of the various fungicides that are now advocated. But I believe, and I speak from experience, that in a cold, wet locality, it is likely to be more effective for wheat than sulphate of copper, and if proper precautions be taken, its effect on the vigor of germination will be found to be no more detrimental than the other substances that are in use for this purpose. In dry districts I believe bluestone is to be recommended. In using formalin it is best to purchase Schering's, which should contain 40 per cent. of the active principle (*formaldehyde*). The pickling solutions that have been used in the past have varied from $\frac{1}{4}$ per cent. to $\frac{1}{2}$ per cent., but it may be taken as proved that the weaker solution is the more satisfactory for general purposes. This is made by adding four fluid ounces of Schering's formalin to 10galls. of water. Personally, I am in favor of the barn floor system of pickling, as in this way, if the work be properly carried out there is less chance of grains becoming enclosed

in a film of air and thus shut off from contact with the solution. If, however, you prefer the steeping system, the grains should be immersed for from five to six minutes. The important point to remember in pickling with formalin is that if allowed to stand too long before being sown the berries become very hard and stony. Formalin-pickled grain should be sown not later than two days after pickling. If, however, circumstances arise which render it necessary to hold the pickled grain for a longer period it will be as well to moisten it again with ordinary water before drilling or broadcasting, as the case may be."

SORE SHOULDERS IN HORSES.

"R. C." Port Broughton, writes—"Can you tell me of anything which will help to heal horses' sore shoulders? We see to their collars well and sores cease to chafe and are no longer raw, but under a small surface left in the middle a bad core has formed and the shoulder has swollen very much. The horses cannot then be worked until the swelling goes down. We give them three short feeds of oaten hay with crushed oats, and one feed of long hay—I would say they get about 1lb. of crushed oats per horse each feed (oats are now six months old)."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"I advise the owner to bathe shoulders with cold water immediately after work, and then apply the following lotion:—Sulphate of zinc, 1oz.; sugar of lead, 1oz.; water, 1oz., and mix. If the collars are properly attended to horses should not suffer from sore shoulders."

CROP FOR ENSILAGE.

"Vetches" writes to say that he is sowing a mixed crop for ensilage, and would like to know whether rape and vetches make a better mixture than either taken separately to sow with cereals for this purpose.

Mr. W. J. Colebatch, B.Sc. (Agric), Acting Principal of Agricultural College, replies:—"In sowing a silage mixture we have two objects in view, first the securing of a maximum amount of green forage per acre, and secondly the production of an evenly balanced crop, so far as the elements of animal nutrition are concerned. Chiefly on account of the latter consideration, the practice of mixing with the cereal or cereals a crop that will supply a large amount of nitrogenous matter has come into favor, and for this purpose the legumes are relied upon. During the past few years the practice at the College has been to sow a mixture of wheat, oats, and vetches, and very satisfactory results have been obtained, so far as the yields per acre and nutritive ratios of the fodder are concerned, but very considerable difficulty has been experienced in the cutting of the crop. The binders are continually clogging up with the matted growth due to the vetches, and this has involved such a serious loss of time that we have now resorted to further trials with legumes of a less straggling nature. Given a fair season, I question if there

is any practice that will do so well as the substitution of 4lbs. to 6lbs. per acre of lucerne in place of vetches. Not only will this give us a fair proportion of nitrogenous fodder in the butts of the sheaves, but, in addition, after the crop is removed it furnishes a very useful field of spring and early summer feeding. In good seasons it will last well on to the autumn, and under favorable conditions may be allowed to stand over to serve as a grass paddock for the second year. We are also experimenting with tick beans, and in districts to which they are suited field peas would be worth a trial. It is evident, however, where lucerne can be successfully grown, in a silage mixture it possesses paramount advantages over all other legumes, and should therefore be given a very thorough trial for several seasons before preference is given to any other crop."

LUCERNE-SOWING.

"Uolta" writes:—"Will you kindly let me know when is the right time to sow lucerne, and which is the best method?"

Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S. (Acting Principal of Roseworthy Agricultural College), replies:—"Lucerne may be either spring or autumn sown. As a rule, where irrigation is not possible, the best practice north of Adelaide is to seed it about the end of April or in May. If it is sown under suitable conditions at this time of the year on land that is well drained, it will survive the winter frosts and soakage, and grow into a strong plant in the early spring. Autumn seeding has this further advantage: that if the 'strike' obtained is not satisfactory it can be patched up in the spring, whereas if the spring sowing is a partial failure it is rarely possible to thicken it the following autumn, as the plant has by then become too vigorous. If irrigation is available it is better to give the land a good soaking, say, at the end of August and sow the lucerne in September, and thereby escape the danger of winter killing. The more important points in connection with the sowing of lucerne are as follows:—Get the best seed on the market and, if possible, get a guarantee that it is free from dodder; Hunter River or Tamworth seed is usually to be preferred, but if the amount per acre be increased satisfactory results are obtained from European samples; from 10lbs. to 12lbs. per acre is sufficient, and this should be sown in two portions, unless the drill is employed. When using the ordinary 'Cahoon' broadcaster, it is wiser to sow 6lbs. in one direction and the balance at right angles; this ensures an even covering. The land must be clean. It is better to lose a season in bare fallowing than to throw money away on a dirty lucerne bed. Again, the soil must be worked down very fine, so that the seed is evenly covered. It should be sown on a rolled surface and then brush-harrowed, or run over with the ordinary harrows up-side-down. The seed bed should be in good heart, and it should receive a dressing of $\frac{1}{2}$ cwt. superphosphate per acre prior to seeding. In subsequent years resort may be had to basic slag, bonedust, or similar forms of the less soluble phosphatic fertilisers."

WIRE-NETTING DRYING TRAYS.

"S. A. B.," Teatree Gully, writes—"Having read of wire-netting trays used for drying Zante currants, I wish to know the size of the mesh and the space between the trays when they are stacked."

The Horticultural Instructor (Mr. G. Quinn) replies—"The sides and ends of wire-netting drying trays, which are on the market, are made of 3in. x 1½in. oregon, on which the wire-netting of 1½in. mesh is stretched taut. When stacked, there is an open space of 3in. between the sides of the trays and 1½in. at the ends. The trays at present being made measure 7ft. x 2ft. 4in. over all, which allows for the roofing of a double tier by means of a double row of the ordinary small wooden trays. The trays cost £14 per 100. Each will carry as much fruit as several of the old-style wooden trays. The cost should not prove prohibitive. The advantage claimed for these trays is that air circulates around, between, and beneath the bunches. Of course, a floor of close trays or other material must be spread beneath the stacks to catch loose berries which fall through the meshing."

WHEN TO CHURN CREAM.

"R. J." asks—"What is the best stage at which to churn cream?"

The Dairy Expert (Mr. P. H. Suter) replies—"Do not churn cream when sweet; wait until it has a nice, clean, acid flavor. This will give you a nicer flavored butter, possessing better keeping qualities."

STREAKINESS IN BUTTER.

"Dairymaid" asks—"What causes streakiness in butter?"

The Dairy Expert (Mr. P. H. Suter) replies—"Streakiness in your butter is simply due to insufficient working in of the salt. Work it well in, and you will not be troubled."

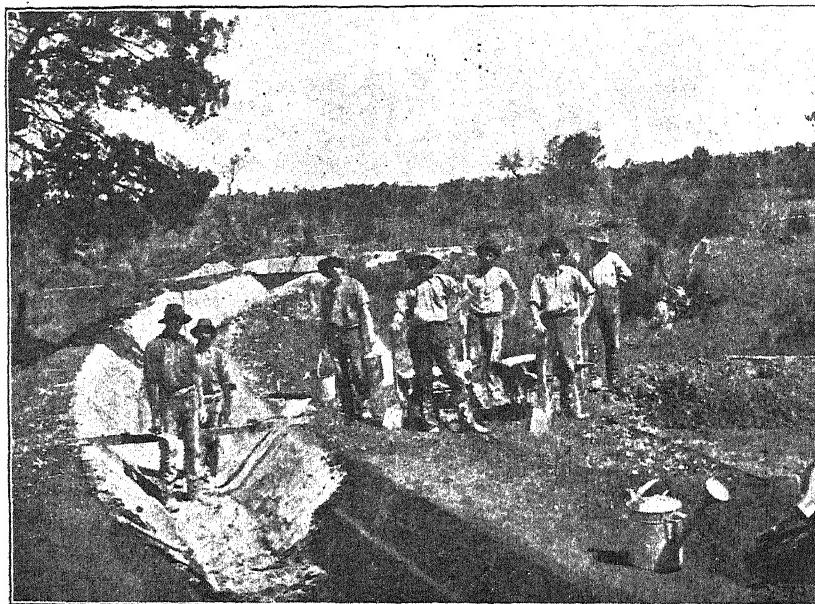
ENSILAGE.

"E. F.," Kingscote, writes—"I have an underground tank which I wish to turn into a silo, 5ft. deep by 9ft. in diameter. As I have not got a cutter, can the green stuff be put in long, and how? How long after filling will it be fit for use? About how many tons would this tank hold? Would it require covering to keep the rain out?"

The Dairy Expert (Mr. P. H. Suter) replies—"This tank is very small, and I would suggest adding another 8ft. or 12ft. to make it higher, and thus allow for better pressure and less loss. However, you can make ensilage if you have not a cutter by carefully placing your green material lengthways and crossways, and filling up as high as you can get it. Sprinkle with coarse salt every 2ft. The ensilage would be fit for use any time after two months. Your present tank would hold very little, and you would lose almost all. You must build it up very high, so as to carry 12ft. of green stuff after being stacked four days. This should then be covered with straw—say, 3ft.; and upon this put posts, stones, earth, &c., to weight it down and exclude the air."

BERI BERI IRRIGATION SETTLEMENT.

Another link is to be added to the chain of irrigation colonies along the Murray. Beri Beri lies on the right bank of the river a little below Lyrup, at the foot of some gently sloping hills, and the soil is strong and capable of producing almost anything with the judicious application of water. The survey of the first portion of the settlement, comprising an area of about 4,400 acres, will be completed in two or three weeks, and the land will be



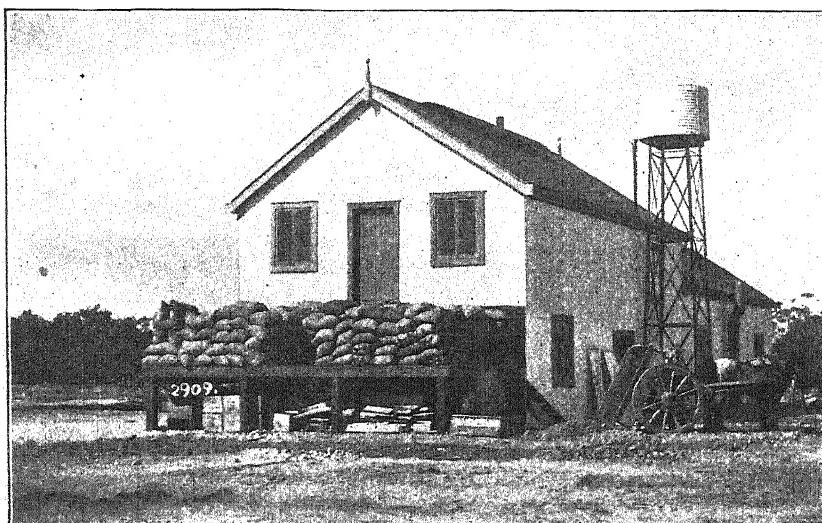
Water Channel being Excavated and Lined with Concrete.

ready for gazetting. It will be open to application as soon as the prices are fixed by the Land Board, as the survey of the 28 non-irrigable blocks will then be completed.

The irrigable blocks, which number 33, vary in size from 10 acres to 50 acres, and comprise altogether about 900 acres. The irrigable area will be supplied with water from the river into six channels, which are from 5ft. to 6ft. wide at the top, 1ft. 6in. to 2ft. in depth, and 1ft. to 2ft. wide at the bottom, and these seven miles of channels, having a fall of 2ft. to the mile, are all concreted and are capable of supplying the whole of the 900 acres

with 6in. of water in four days. The water is pumped from the river into three channels at the rate of 180,000galls. per hour to the highest lift. The first lift is 40ft., the second one 76ft., and the highest is 124ft. from average low water.

The pump is a 12-in. high duty centrifugal pump, manufactured by Robinson and Co., of Melbourne, and is fitted with swivel bends so that it may be moved to any position for suction and delivery. This pump is driven by a gas suction premier engine of the positive scavenger type, twin cylinder, and 290 brake horse-power, and the gas is supplied from a producer of 340 brake horse-power. The whole of the work, with the exception of the engine,



Engine-house and Bags of Charcoal.

was manufactured in this State. It is claimed that the plant can be pumping its full capacity of 180,000galls. per hour within five minutes of lighting the fire.

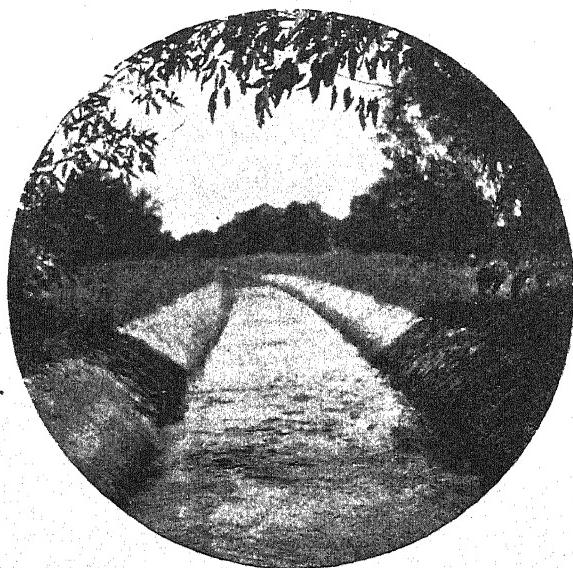
The rubble for making the concrete consists of the hard, water-worn limestone nodules which are found on the slopes of the hills above the river. These are riddled to obtain the proper sizes for the work, and the sand—clean and sharp—is obtained from a cliff close to the irrigable area. An outcrop of sandstone has been reserved for a quarry, so that the settlers will have wood and water, stone, sand, and lime ready at hand.

The piping which conducts the water from the pump to the channels is 15in. spiral riveted and 2,262ft. in length. The engine, gas-producer, and pump are enclosed in a very substantial galvanized-iron engine-house. The charcoal which is supplied to the gas-producer is burnt in two retorts. It

is estimated that three to four tons of mallee are required to make a ton of charcoal. The engine consumes $\frac{3}{4}$ lb. of coal per horse-power per hour or, say, 3lbs. of wood.

The cost of the plant, pump, retorts, piping, and channelling, including all expenses of surveying, levelling, &c., so far is about £12,000. Interest on the cost of channelling at the rate of 4 per cent. will be included in the rental of the land as may be fixed by the Land Board, and the cost of the pumping plant will be repaid by a rate for supplying the water at a minimum charge of 25s. per acre, for which charge 24in. of water during the season is guaranteed, and any extra supply of water, if required and available, will be charged for at the rate of 1s. per acre per inch.

The completion of the proposed Beri Beri Settlement will include a further irrigable area of about 1,600 acres, and the total area (including other land) will altogether be about 19 000 acres. To supply the 1,600 acres with water about $14\frac{1}{2}$ miles more of channels will be necessary, in addition to another pumping plant of about double the capacity of the one now installed. The whole of the settlement comprises first-class sandy loam, capable of growing vines, fruit trees, lucerne, and other fodder plants, and it is probable that the settlement will be largely utilised for dairying purposes.



PRINCIPLES OF CULTIVATION.

By W. P. SNYDER and W. W. BURR, of Nebraska Agricultural Experiment Station.

SURFACE CULTIVATION.

By surface cultivation we mean stirring the soil with some implement which loosens the soil to a depth of only a few inches. We cultivate the soil to kill weeds and to elaborate plant food by the admission of air and by producing favorable temperature and moisture conditions for the action of soil bacteria. Cultivation is necessary to retain the soil mulch, which checks the evaporation of water and saves it for the use of the crop. If weeds are allowed to grow they rob the soil of moisture which is needed by the crop and reduce the yield. Conserving moisture by means of a mulch on the surface is very important to the farmers of the region of North Platte. We well know that we are subject to droughty conditions or dry periods during the summer. If a proper mulch has been retained it is highly probable that enough water will have been carried over from previous rains to protect the crop during the drought. This is more probable where the dry weather is of rather short duration, even though it comes at a critical time in the growth of the plant. The surface should be kept loose so that the water will be absorbed rather than run off. A large percentage of water from a heavy rain will run off from a hard, unstirred surface before it has time to soak into the soil. After getting water into the soil we must cultivate to restore the mulch and prevent loss by evaporation.

We cannot give the time and depth of cultivation to suit each farm, but a few principles may be given. We should cultivate often enough to keep the weeds down and retain our mulch. Water is lost very rapidly from the soil after a rain, and cultivation should commence as soon as the soil will do to work. A very sandy soil can be worked while yet wet, and when worked at that time there is less danger of blowing. A heavier soil may bake or puddle if worked when wet, and should not be stirred until dry enough to prevent baking.

Small Versus Large Shovels.—Small shovels have several advantages over larger shovels in this region. The small shovels do not ridge the soil as much as large ones, and therefore leave the surface less exposed to the drying action of sun and wind. There are ordinarily more shovels on the small

shovel implements, and they stir the soil better than a smaller number of larger ones. The larger shovels generally run deeper and do more root-pruning than the smaller ones, especially late in the season. The roots furnish the plants with food and water; therefore each root cut off injures the plant that much. Where land has become weedy for any cause, large shovels are much more efficient in killing the weeds. If corn is small they may be used without injury and may be followed later by the small shovels. Corn which is 18in. high is very likely to be injured by deep cultivation if dry weather follows the cultivation.

The exact depth of cultivation varies with type of soil and climatic conditions. Deep cultivation cuts off too many roots and exposes an unnecessary amount of soil. On the contrary, very shallow cultivation does not give a sufficient mulch to hold the moisture. In this region cultivating to a depth of 3in. will probably give the best results on our upland loam soils.

SUMMER TILLAGE OR CLEAN SUMMER FALLOW.

There is probably no one method of tillage peculiar to dry land agriculture that affects crop production as much as summer tillage. By this we mean the practice of cultivating the soil an entire season or a large part of the season without a crop in order to accumulate the moisture and produce the physical condition in the soil which will force the growth of the crop when planted. In the extremely dry regions this means cultivating the land one year to grow a crop the next year. In central and western Nebraska this is equally true, except where winter wheat or other fall grain is sown, or where grasses are sown in the fall, after a period of summer tillage, rather than to sow in the spring under less favorable conditions. Where a crop is sown in the fall, the land will have been under thorough tillage from spring until the sowing of the crop in September. Summer tillage differs from the old practice of summer fallow in this: that the old system frequently was to plough the land in July and let it lie bare without working it until near the time for sowing wheat in September, when the land would be put in good condition unless it had been overrun by weeds or become cloddy from excessive drought. Even the best system of summer fallow in the eastern States did not give so much attention to the accumulation of water in the soil as is done at the present time under the best system of summer tillage.

In the dry farming region the practice of summer tilling is followed primarily in order to store water in the soil, and secondly to secure a good physical condition, a good seed bed, and to accumulate plant food by securing conditions favorable to the breaking down of humus and the accumulation of nitrates in the soil. The land must be kept thoroughly cultivated to kill the weeds and retain the surface mulch which checks the evaporation and holds the water which accumulates from the rains until it is needed for the use of the crop. In summer tillage the weeds must be kept down, since the

growing of a crop of weeds draws heavily upon the supply of water and largely defeats the purpose of summer tillage.

The work at the North Platte Station (average annual rainfall, 18.86in.) carried on during the last two years to study the conservation of soil moisture by summer tillage has shown that we can store 15 per cent. of the weight of the soil as water in the upper 6ft. of the soil under conditions such as have existed there in the years 1907 and 1908 (rainfall, 1907, 19.61in.; 1908, 19.96in.). This is equal to about 14in. of water stored in the soil, and should insure a fair crop of winter wheat, even with a minimum rainfall the following year.

Not all the water in the soil is available to the plant. The water is held in the soil as a film around the soil particles and also by surface tension in the small pore spaces of the soil when it is very wet, as frequently happens immediately after a heavy rain. When the soil is carrying a rather high percentage of moisture the film of water is thicker and more of the small spaces between the soil particles are filled. Water held in the pore spaces has a tendency to sink down to lower levels by gravitation and to be brought back to the higher levels when the moisture is drawn from the upper soil by evaporation or by the roots of plants. A considerable portion of the water held as a film around the soil particles is available for the use of the plant. As the soil becomes drier this film becomes thinner, the plant is less able to get water from the soil, and finally a point is reached where the plant cannot get enough water to meet its requirements. This is often shown in the middle of the day when the plant begins to wilt or roll. As evaporation is checked by the lower temperature during the night the plant is again able to take up the water from the soil more rapidly than it transpires through the leaf area, and the plant revives. The point at which the plant stops growing or dies depends on its ability to withstand drought. From a study of such conditions in the field we find that the growing crop can draw the moisture from a soil of the type comprising the North Platte farm down to about 7 per cent. without serious injury to itself other than a checking of growth as the water in the soil approaches this lower limit. Where 15in. of water have been stored by summer tillage this gives about 8in. available for the use of the crop in addition to the natural rainfall during the growing season, and has been sufficient to insure a good crop of winter wheat in any year since work began at the North Platte Station.

This year (1908) we have succeeded in getting into the soil and holding only about 50 per cent. of the rain which fell during the period of summer tillage. This is due partly to the character of the rains. During a heavy storm the water will fall faster than the soil can absorb it, even though the surface is kept loose by cultivation. Considerable moisture is lost after every rain before a good mulch can be established to check the evaporation. Often rains will come in light showers that do not penetrate into the soil

deeply enough to be held by surface cultivation. Any shower which does not do more than to wet the surface mulch on summer-tilled land is a damage rather than a benefit from the standpoint of storing water, since the water in the surface mulch is again lost by evaporation and labor is required to restore the mulch and prevent the loss of water which had previously been stored. Such showers are frequently of very great benefit to the crop, and may be sufficient to mature a crop which is nearly ripened or to hold it through a period of drought until subsequent showers are available; but for the purpose of storing moisture in summer-tilled land any rain of less than one-third of an inch is of very little importance.

The practice of summer tilling has increased the yields of small grains very materially. In 1906 the average yield of wheat on 10 acres of rather poorly summer-tilled land was 42·5bush. per acre. In 1907 the average yield of wheat on four and one-half acres of summer-tilled land was 59bush. per acre. Wheat on an adjacent plat not summer tilled produced 24·4bush. per acre. Wheat on regularly cropped land not on the station farm averaged from 15bush. to 20bush. In 1908 the average yield of wheat on eight acres of summer-tilled land on the bench was 56·7bush. Tableland gave about the same yield when summer tilled. Two and one-half acres of wheat on tableland cropped in 1907 to winter wheat and again sown to winter wheat in the fall of 1907 averaged 20·8bush.

The yield of oats, spring wheat, and barley was also greatly increased by summer tillage, but not in as great a ratio as in the case of winter wheat. Where land was summer tilled for corn (maize) the yield showed no increase over ordinary tillage. While increased yields of all spring grains resulted in 1908, we are not yet ready to recommend the use of summer tillage where the land must lie bare throughout the winter season and be subject to blowing in the winter and early spring. We are, however, convinced that for winter wheat a period of summer tillage is profitable, and that large areas of winter wheat might be raised in the western part of this State under this method where winter wheat cannot be profitably raised without summer tillage. A short period of tillage to accumulate moisture and kill the weeds is also very profitable where land is to be sown to alfalfa. Two or three months of good tillage with alfalfa sown in July or August will often give a much better stand than to sow the alfalfa in the spring and be obliged to fight the weeds during the summer by frequent mowing. This method will be especially useful in the western part of the State where land has been growing corn for several years and has become foul through lack of cultivation. Good cultivation until the middle of June will likely kill most of these weeds and put the land in condition to get a splendid stand of alfalfa.

In summer tilling the implements used and the frequency of tillage differ with the climate and the soil. There are two main factors to be kept in view, namely, keeping the surface loose to check the loss of water by evapora-

tion, and preventing the growth of any weeds which also draw water from the soil. If either is neglected, good results are not likely to follow.

In central western Nebraska, land which has been in stubble and is to be summer tilled the following year should be thoroughly double-disked as soon as possible after the grain has been harvested. This will loosen the surface and prevent the loss of water by evaporation. It will also serve to hold any rains that may come in the fall. The disking also destroys the weeds that grow on the stubble-field after the grain has been cut. Early in the spring, as soon as the frost is out of the ground, the field is again double-disked. The surface is then kept loose and the weeds kept down with disk and harrow until June, when the land is ploughed 8in. deep. This gives ideal conditions for catching the water which falls, and by proper cultivation to restore the soil mulch the soil becomes a reservoir in which the moisture is accumulated for future use. If this treatment is followed it will be found that the land when ploughed contains an abundance of moisture, and with ordinary rains this moisture penetrates deeper and deeper into the soil with each successive rain. From ploughing until seeding time the weeds are kept down and the surface loose with the harrow and with the disk. The layer of loose soil on the surface forms a mulch, which protects the moist soil beneath from loss of water by evaporation. It also allows the air readily to pass into the soil and aid in the liberation of plant food. The mulch on the surface should be kept loose and dry, but the granular structure of the soil should, if possible, be retained. If the soil is pulverised to a fine dust it may blow away or it may pack so firmly as to need frequent cultivation in order to restore the mulch. It is not practical to summer till soil which blows readily, as the frequent high winds in the region will cause the soil to drift.

The depth of cultivation or of the mulch depends much on the type of soil. A fine, heavy soil requires a deeper mulch than a coarse-grained soil, as the finer soils have greater capillary power and are more difficult to keep loose and open. Deep cultivation may be less frequent than where shallow cultivation is used. If we keep a thick mulch it will require more water to destroy the mulch and connect with the water below. A shallow mulch is less serviceable and more readily destroyed by light showers. We have found it almost impossible to keep the weeds down and retain a good mulch with an ordinary spike-tooth harrow, and it has been necessary to alternate between the harrow and the disk in order to keep the field clean. A mulch of 3in. or 4in. is more efficient and can be retained with less labor than one which is but half as deep.

The frequency of cultivation depends also on the type of soil and the frequency of the rain. Cultivation should always follow a rain which is heavy enough to wet through the mulch and destroy it. A shower packs the particles of the surface soil close together, washing the finer particles down into the open spaces. This restores the capillary connection, and the water

may be brought to the surface from below and escape. Cultivation should begin as soon as possible after the rain, as the high rate of evaporation quickly draws the water from our soils. During a period of prolonged drought it may be necessary to cultivate between rains. When we have a moist soil underneath and a mulch on the surface there will be some movement of the water from below into the mulch. As this becomes moister it loses its efficiency in checking the evaporation of the water, and cultivation is necessary to loosen the soil particles, which again checks the evaporation.

We have not yet determined how often it is practical to summer till a field, but have under way experiments in which certain fields and plats are summer tilled every second year, others every third year, others every fourth year, and still others every fifth year. These experiments show that the summer tilling may increase the yield for at least two years after it has been practised. This is probably due not so much to the additional water available for the second crop as to the physical condition of the soil and the greater supply of available plant food.

Cost of Summer Tillage.—The main objection made by the farmer to summer tillage is the additional amount of labor. Thus far in the history of western Nebraska the rental of the land has not been considered. Even at the present value of tableland the interest on the investment should not exceed \$1.50 per acre. It would seem that even at present values the rental in western Nebraska does not prohibit summer tilling. The labor is not very much more than that performed by the better farmers in eastern Nebraska in their ordinary farm methods. If winter wheat is grown in western Nebraska it is necessary that a good seed bed be developed and sufficient moisture accumulated to germinate the crop and protect it through the winter season. With seven or more inches of water, which the plant may use, stored in the soil, we believe that winter wheat will mature a fair crop during seasons of very light rainfall, when wheat on land not summer tilled will be a failure. By summer tillage methods it will require three or four double-diskings, three or four harrowings, and one ploughing to grow a crop of wheat which should yield 40bush. or more per acre where 15bush. or 20bush. are produced on land not summer tilled. Winter wheat on summer-tilled land is the safest, surest crop we can grow on tableland, but without summer tilling it is probably as uncertain as any crop grown.

Ultimate Effect of Summer Tilling.—Frequent summer tilling may be more or less detrimental to our land. The changes which break down the humus in the soil go on very rapidly under the conditions afforded by summer tilling and must exhaust the entire supply more quickly than where some method is practised which does not furnish so good conditions for the destruction of humus in the soil.

We feel safe in recommending summer tillage for small grain, especially winter wheat, but advise that a rotation be followed which will keep up the organic matter in the soil and conserve its fertility. Such a rotation will probably use summer tillage on the same field only once during a series of years, and will have a grass, legume, or some green manuring crop which will put back into the soil the organic material taken from it. Where sufficient barnyard manure is to be had, an application of it once during the rotation will probably keep up the humus and conserve the fertility of the soil. Where manure is used it should be applied as evenly as possible on the land, and disked to mix it with the surface. It should be applied at a time and in such a manner as to be a benefit rather than a harm to the succeeding crop.

From our experience we cannot lay down a definite system of rotation for all conditions. The rotations must be worked out to suit the farm where they are to be practised. A rotation that seems well adapted to our conditions is as follows:—Summer tillage, winter wheat, corn (maize), spring grain, cane. Summer till and sow winter wheat; disk and fall plough the wheat stubble for corn the next year; disk the corn stubble for a spring grain—oats, wheat, or barley, apply manure during the winter, disk in spring and plough for cane, which crop completes the rotation. To practise this rotation a farm should have at least five fields. This five-year rotation gives winter wheat on summer-tilled land to be sold as a cash crop, corn and spring grain to be fed or sold according to conditions, and cane for forage. If the forage and grains are fed, there will be enough manure to apply in the rotation, covering one-fifth of the land each year.

In exclusive grain-farming—which is a hazardous proposition at best—some crop must be turned under to keep up the fertility. This is equally true whether summer tilling be practised or not. We have this year obtained very good results from green manuring with rye and with cowpeas. The yield was not up to that on summer-tilled land, but was nearly as large. In each case the crop was turned under and the land kept well tilled for the balance of the summer, and the land sown to grain in the spring. If this can be done with a reasonable certainty of success, it may be more profitable than summer tilling. It gives much the same condition of the land as summer tillage and at the same time enriches the soil by the addition of humus. In very dry years it is doubtful if this will give as high yields as summer tilling, since there will be hardly enough water to rot the crop turned under and give a good seed bed in which to sow the next crop.

We feel that the practice of summer tilling is and can be kept profitable by systematic rotation of crops in which summer tilling shall be used only occasionally. If used without care, it may prove very detrimental. If used judiciously it will tend to free the fields from weeds and guard against total crop failure and to greatly extend the winter wheat growing area.

SUBSURFACE PACKING.

The process of subsurface packing should be emphasised in connection with summer tillage and storing soil moisture. Subsurface packing is the process of firming the furrow slice by packing it firmly against the soil below. This process fills the open spaces that may have been formed by turning under clods, manure, or other coarse material in ploughing. It also packs the soil particles closer together and against the soil which has not been stirred. This is essential in order to keep the furrow slice supplied with moisture from below. The water in the seed bed is drawn up from below from one particle of soil to the next one, as oil is drawn up through a lamp-wick to the flame. To lift the water towards the surface the soil particles must be close together, so that the water may move from one to another. If we do not pack the soil after ploughing, or plough early enough to allow it to settle or be firmed by rains, the furrow slice will not be in good capillary connection with the lower soil and may dry out while there is still an abundance of moisture in the subsoil. The evil results from a loose seed bed are often seen where a large amount of coarse manure has been ploughed under and where dry weather follows before the land has settled.

Another advantage of packing is that stubble, weeds, or manure will decay much more quickly if the soil is pressed down firmly around them. Water is required in the process of decay, and the organic material must be in close contact with the soil in order to draw water therefrom. Where the field is rough and cloddy when ploughed, the clods hold the soil apart and allow it to dry out.

We may employ several methods of firming the soil. There is for sale a tool known as the subsurface packer, which is built especially for the work. Most farmers do not have such a tool, and some feel that they cannot afford one. A disk can be used, and proves a good substitute for the surface packer. The disk should be weighted and run straighter than in regular work. This will do very little pulverising, but will firm the soil below the surface. Some men hitch an extra horse on the ploughed side. The horse firms the soil by walking on it. A section of harrow is hitched to this horse, and the surface is made fine by the harrowing before it becomes dry and cloddy. Each furrow gets about three or four harrowings. If the soil has a tendency to blow readily, the surface should not be pulverised as finely as so many harrowings would do.

No matter what process is employed, the seed bed should be firm when the seed is sown. We have noted many cases where grain died out and winter killed much more on loose, ashy-like soils than it did where the soil was more firm. This is especially true of grasses.

SEED BED.

A good seed bed is one in which the soil has been brought into such mechanical condition as to best meet the requirements for germination of the seed.

All seeds require water, heat, and air for germination and growth. A good seed bed must be fine and firm, and must have heat, moisture, and air enough to germinate the seed. It must be loose enough for the air and water to enter from above, but firm enough so that moisture may be brought by capillary action from below to the seed which is firmly packed in fine soil.

The most common method of loosening the soil is by ploughing. When the soil is ploughed it is so loose and broken that air, heat, and water can readily enter. A loose soil will hold much more water than a hard soil. We can loosen the soil more thoroughly with the plough than with any other implement. It goes deeper and pulverises more than any other tool. The plough completely severs the upper surface of the soil and turns it under. Stubble and weeds that are on the surface are turned under and the surface left clean. Every soil should be ploughed occasionally. The heavier the soil the more frequently it should be ploughed. If a soil is very heavy it should be ploughed each time a grain crop is grown. The ploughing will tend to free the surface of weeds and incorporate weeds and stubble in the soil to replenish the organic matter. This cannot be done with a disk, as the disk only stirs the surface. It may cover some stubble or weeds, but not deeply. If the surface is covered with weeds or stubble it is often advisable to disk the soil before ploughing. This will mix the weeds and stubble with the soil and when ploughed under they will be less liable to separate the furrow slice from the under soil.

The time to plough depends upon the character of the soil and climatic conditions. Fall ploughing is generally considered best when it can be done early if the soil is of a type that does not blow during the winter. By fall ploughing we get the soil in shape to catch the rains. The loosened soil has time to settle and become firm again before seeding. There is generally more time for men and teams in the fall than in the spring. The sooner the ploughing can be done after the previous crop comes off the better. Stubble and weeds are turned under and given more time to rot, and the growth of weeds is checked so that they do not go to seed nor rob the soil of moisture.

The depth of ploughing depends on the type of soil, the time the ploughing is done, the previous handling of the soil, and the crop to be grown. Where the ploughing is done shortly before seeding and danger of dry weather exists, the ploughing should be rather shallow, unless plenty of help is available to work the ground until it is thoroughly firmed. If the soil is ploughed deeply and the seed sown without much working, the furrow slice will be loose and may dry out before the young plants get their roots through it and establish them in the firm, moist soil beneath. A light sandy soil need not be ploughed

as deeply as a heavier soil. The lighter soil is already more open and less impervious to water, air, and to the plant roots. Heavier soils should be ploughed deeper to loosen them and allow water and air to enter and the plants' roots to readily pass through them. All else being equal, the deep ploughing is best if it has time to settle and form a deep, firm seed bed from which the plants may draw plant food and in which they may develop strong, vigorous root system.

Each day's ploughing should be harrowed the same day it is ploughed. This is especially true where there is an abundance of moisture, as water will be lost very rapidly after ploughing. The harrow will level the surface, leaving less of it exposed to the drying action of sun and wind. It pulverises the surface and forms a mulch to protect the moisture below. Where a soil is quite dry and there is danger from blowing, it is best to leave the soil rough. Some farmers advocate leaving the surface rough and without harrowing to hold the snow better during the winter. This is all right if our soil is dry when ploughed; but if the soil is moist when ploughed it should be worked down to form a better mulch and check the further loss of water.

Firming the soil is necessary to restore capillary connection between the furrow slice and the under soil. There are generally numerous rather large air spaces formed by ploughing under clods, weeds, &c. This gives good condition for the loss of water, and the furrow slice dries out. When we firm the soil we bring the soil particles closer together and fill these air spaces. The furrow slice is also pressed down against the under soil, and what water is there can move upward into the surface soil and supply the young plants. Where the furrow slice is not firmed before the seed is sown, the plants are dependent upon the water in the surface soil or upon opportune rains. We had just such conditions on certain spring-ploughed plats during the past spring (1908). There seemed to be plenty of moisture in the soil. However, it was used or lost before the young plants had gotten their roots established in the lower soil. The crop suffered severely, even though there was moisture in the subsoil, and did not recover from the loss throughout the season.

If the seed bed has been prepared for some time before seeding, capillary connection has been restored between the surface and the lower soil which will tend to bring the water to the surface. Surface cultivation will check this loss, as the water cannot readily pass through the soil mulch produced by cultivation. This mulch not only prevents the loss of water, but is easily penetrated by the heat and air that are required for the germination of the seed.

The principles of a good seed bed may be summed up as including deep ploughing to loosen and pulverise the soil; firming the soil again by labor or by natural processes to get a firm, warm, and moist soil area favorable to the development of a strong, vigorous root system. These conditions are also favorable to the retention of moisture and the manufacture of plant food for the use of the crop.—*University of Nebraska Bulletin.*

THE RECLAMATION AND AGRICULTURAL TREATMENT OF SWAMP LANDS.

By S. McINTOSH, Manager Murray Bridge Experimental Farm.

The reclamation and agricultural treatment of swamp lands is a question of general interest at the present juncture to producer and taxpayer alike. Time and space do not permit of us referring either to the geological formation or the past history of the lands under review, and we accept them simply as important factors in the natural production of wealth which can, with judicious expenditure of capital and practical management, be improved to such an extent as to substantially increase their value as producing mediums.

MAIN ESSENTIALS.

The three main essentials in the permanently successful reclamation of any given area are (provided the area warrants it)—1. An effective levee or bank capable of withstanding anything short of an 1870 flood. 2. An efficient and substantial surface excavation and embankment for the full length of the adjacent high land, to collect and conduct all drainage from the outside areas direct to the river. 3. Last, but by no means least, a thorough and economical system of drainage, with a minimum depth of 4ft. in the lowest level of the swamp. All of these, in the interests of general economy and efficiency, should be completed before the area becomes occupied. It is laid down as an axiom by Sir H. Brown, C.E., the eminent and practical author of "Irrigation : Its Principles and Practice as a Branch of Engineering," when dealing with "Agricultural Operations and Reclamation Works," that "the land to be reclaimed would be surrounded by a bank to exclude all water other than purposely admitted." With banks erected with peaty material, this object can never be accomplished. The levees should be built of true soil free from all vegetable matter, having a 1 to 3 slope on the river side, and a 1 to 2 inner slope. The outside slope should be covered or protected with a growth of vegetation capable of withstanding the wave action of the waters in the case of a high river; or in the event of no such growth being possible, from the general nature of the material used in the construction of the bank, it can be thatched with reeds or bush, held in place by wire and stakes driven into the earth. This method was adopted on the

embankment protecting Renmark township during the floods of 1890-91, when it proved its efficiency, despite the fact that the waters actually reached to within 6in. of the crown of the bank. Unless the soil adjacent to the levees is of a close or clayey nature it is a mistake to tamper with it, more particularly on the outside. Should the excavation cut into or through a bed of reeds or peaty matter the pressure will force considerable quantities of water through this porous and open medium under the bank into the inside or irrigation channel, and as water invariably finds its own level if permitted, it can readily be imagined what happens inside the dyke in the event of the river remaining for any length of time above its normal level.

CONSOLIDATING THE BANK.

After the bank has been erected, judicious trampling with sheep is a decided benefit to the structure until such time as it has finally settled down, when it should be planted with suitable vegetation. Where creeks are crossed by the embankment lengths of tarred galvanized iron or sheets of other suitable material should be driven deeply into the soft, peaty soil, *i.e.*, until they arrive, if possible, at a comparatively firm foundation, with the object of checking any undesirable access of river water. Inlet sluices with effective gates should be placed through the bank at the lowest river level and at distances of not more than 40 chains apart, except in special instances, where they may be required at shorter intervals.

DRAINAGE.

The irrigation supply channel on the inside of the bank should be sunk to the depth of the inlet sluice adjoining and fitted with water-tight regulating gates not less than 3ft. x 2ft. leading into the irrigating ditches of the adjacent blocks, which should be surveyed for the full depth of the swamp area and possess a suitable high-land frontage. The drain and channel commanding the high land drainable requires to be excavated to the depth of the minimum river level, an inlet sluice being placed at the upper end and a full width flood-gate at the outlet, so as to secure the maximum efficiency both as a drainage and irrigation factor in supplying water to the adjoining portions of the respective blocks which possess a face towards the centre or gut, and also to maintain a domestic and stock supply to the settlers residing along the high-land frontages. A drainage pumping plant is required at the outlet, to deal with such waters as reach there when the river is in flood or is driven up by a strong southerly or westerly blow. The action of a limited and regular flow of fresh water through the high-land channel will tend to leach out the excess of alkali which is always apparent after reclamation on such land. In many cases it is impregnated to such an extent as to effectually check all seed germination, and the soil would appear, judging from the entire absence of plant life, to be absolutely sterile, whereas it contains phenomenal

percentages of plant food, as the following analysis will show:—Weights of fertilising matter to the acre foot—No. 1—Nitrogen, 41,275lbs.; phosphoric acid, 5,200lbs.; potash, 39,325lbs. No. 2—Nitrogen, 11,375lbs.; phosphoric acid, 15,275lbs.; and potash, 58,500lbs. Both of these soil samples were taken from the north-western portion of section 561, hundred of Mabilong; but up to the present, through an excess of saline drainage from the outside areas, not a grain of seed has so far germinated there. The complete drainage system includes a main drain, drains, and sub-drains, with an efficient pumping plant. The main or collecting drain runs for the full length of the reclaimed area along the centre of the gut or lowest levels, where the maximum deposits of alkali exist. To secure the highest efficiency with economy, the drain in question should have a depth of 4ft. at the shallowest part, with an average width across the bottom of 4ft., and a 1 in 2 slope. Even with this depth the lucerne is allowed a 48in. taproot only; consequently the gut must be sown down with suitable grasses or retained for winter cereal and summer fodders to secure the most successful and satisfactory results. An effective drainage pumping plant, consisting of a centrifugal pump driven by an oil engine, both of the latest and most economic design, and with a discharge capacity of not less than 50,000galls. per hour to each 150 acres of land reclaimed is desirable, as in the case of a heavy flood it is necessary to reduce the waters with the utmost promptitude and dispatch. The plant must be erected on the most convenient site, and if possible at the drainage outlet, where it can serve the dual purpose of disposing of the swamp, surplus, and leaching waters, and also the high-land soakages when this level falls below that of the river. The foundation of the engine and pump should be above the general swamp level, or in such a situation that they can be readily protected in the event of a heavy inrush of water from a breach in the bank submerging the greater portion of the area; in which case the pump would be required to promptly reduce the waters after they had fallen below the river level. We are presuming, naturally, that the breach would occur when the river was either in flood or when it was being held up with a blow. The main drain would require to be proportionately wide and deep at the sump or well, with a fall of at least a foot in the mile to facilitate the drainage flow and to maintain an adequate supply to keep the pump working, instead of waiting every few hours for the water to collect, as is the case with a drain of smaller dimensions. At the extreme end of the reclaimed area the main would not exceed 18in. in width at the bottom, gradually increasing in width and depth towards the pumping station. A windmill with a capacity of from 5,000galls. to 7,000galls. per hour for each 150 acres reclaimed should be erected alongside the pumping plant. This could run with a minimum of expense, and would prove effective in keeping down the drainage, except in cases of storm floods, or when the settlers were leaching. Possibly the time will come, when the excess

of alkali has been removed and the soil solidified, that a series of improved mills may provide all the power necessary to deal with the surplus drainage. Drains are necessary along the boundaries between blocks to prevent seepage and alkali being forced from one block to another. These are connected with the main, and they do not require to be more than 15in. bottom width at the point farthest from the outlet, increasing to 18in. or 2ft. where they throw off the drainage into the centre. These drains are further connected with a series of sub-drains every one to three chains over the whole area, according to the nature and general porosity of the soil. Later on no doubt an economic system of tile drains will be adopted, *i.e.*, when the settlers have fully realised the true value of a thorough soil drainage. One of the first principles in the practice of irrigation is that irrigation water, to be entirely beneficial, must reach everywhere but remain nowhere. When we first commenced operations on portion of the farm, now over four years ago, drains three chains apart served the purpose, but as the soil bacteria succeeded in gradually reducing the immense stores of vegetable matter into soluble plant food, the density of the soil naturally increased, with the result that the time is not far distant when we will require to place permanent sub-drains (closed tile for preference) at regular intervals of not more than 66ft. apart throughout the lower portions of the farm lands. Outlet gates or stops are necessary at intervals in the subdrains for the purpose of regulating and holding up the water intended for irrigating or leaching purposes.

CLEANING THE LAND.

The original swamp is usually covered in part by at least three separate classes of reed or rush. The best naturally drained land, with the closest texture and situated usually along the river side of the area, is covered more or less by what is known as "bunch-rush." These tufts are readily removed by a mattock, the tops burnt on the ground, and the roots either carted off or (if not too numerous) disced up and gradually worked back into the soil. This class of country is comparatively free from alkali and can be successfully cropped immediately following the clearing process. A lesser proportion of the swamp area is usually covered with a dense and matted growth of the ordinary fresh-water reed, common to the Murray banks around here, and also along the borders of other slow current fresh-water streams and permanent waters of the southern portion of Australia. The most practical and economical method of dealing with this growth is to allow the soil on which it grows to dry out thoroughly and remain in that condition for one or more summers, keeping as many stock on the site as it will possibly carry until such time as it has been practically killed, and then getting to work with a cutter drawn by three or four strong horses and gradually cutting the now semi-solid boles of the stems and root matter off level.

with the ground surface. A man or two requires to follow the cutter for the purposes of rolling the severed masses out of the way of the team. On their next round the loose matter can be carted off on to waste land, where in time it will be reduced by natural agencies into a rich and valuable humus. Clearing this class of land by this agency is a fairly costly process, but it is much cheaper than if done by hand labor, and is certainly much more economical and satisfactory than the burning process which is all too commonly practised to the lasting detriment of the soil. Reed country is undoubtedly the richest quality land we have on the swamps, but the action of fire promptly reduces it to the poorest, a fact which is amply demonstrated by local practice. "Moomarunkie," or sword-rush, clothes a further section of the area. This is first burnt off when the swamp is still filled with water to within an inch or so of the surface, after which the soil should be kept dry, as with reeds. As soon as the growth has apparently died off plough the land with a single or double furrow plough fitted with strong revolving coulters. Unless it is proposed to leave the land as fallow for at least six months it should not be turned over for a depth of more than 3in. or 4in. at most, the shallower the better. Then disc and cross disc, and follow with a grader and heavy roller to press the vegetable matter together as much as possible, and thus facilitate its decay. Sword-rush country is a sure indication of an appreciable percentage of alkali in or near the surface. Almost invariably there are considerable areas of soil clear of plant growth. This condition of affairs is generally due to excess surface alkali, which is not indicated by any other outward signs until the cultivator works it down and plants his crops, after which it soon divulges its presence. Various other lesser areas are covered with divers forms of plant life, all of which can be eradicated with practical and careful cultivation. Owing to the generally uniform levels and falls on the swamp lands but little or no grading is necessary. Irrigation ditches with a 2ft. bottom and 5 or 6 to 1 slope and graded banks are recommended. The depth should command the inflow from the adjacent river sluice, gradually working out to a depth of not more than 2ft. at the lowest point of the block which it traverses. In all average levels the ditch should be one-half below the ground surface. Ditches should invariably be placed to command, if possible, a distance of from 3 chains to 5 chains on either side. This system of irrigation once adopted should never be varied until such time as the excess alkali has been driven out of the soil into the drains and away from the area. Drains can be ploughed and crowded out to a depth of at least 18in., after which, as we have no drain plough available, the work requires hand labor. Irrigation ditches are made entirely with the plough and crowder. The object of the long slopes of the channel banks is that they may be utilised for lucerne or other perennial crops, and thus obviate the weed nuisance, while at the same time returning a profit to the owner from otherwise waste land. On the majority of our swamp

lands considerable accumulation of salts or alkali have been deposited from time to time through the waters evaporating during dry periods. All-wise pessimists inform us seriously that we cannot possibly get rid of the "salt trouble," as there are inexhaustible supplies below the surface. With a view to testing this assertion I had an analysis made respectively of the first, second, and third foot in depth from one of the most affected portions of the farm area, which had been partly leached yet would not grow anything other than *Panicum Crus galli*. The results rather tend to upset the hopeless theory of our croakers. They are as follows:—No. 1, surface foot of soil, 3·6 parts per 1,000 of sodium chloride; No. 2, second foot in depth, 1·3 parts per 1,000 of sodium chloride; No. 3, third foot in depth, 0·3 parts per 1,000 of sodium chloride. With not more than two or three leachings, and a system of drainage as already outlined, this class of soil could be purified to such an extent as to grow either lucerne or cereals with success.

VALUE OF LEACHING.

In Holland after reclamation the lands are left idle for the first year, during which period the natural washing which it receives from an average 28in. rainfall (with a much lower mean temperature) goes far to carrying the soluble salts through the soil by percolation into the drains, whence the drainage is pumped out into channels leading to the sea. With an average 14in. rainfall and a much higher temperature we are forced to adopt the leaching or artificial washing of the salt-affected areas by letting in the river water (which usually contains little more than a trace of salt), flooding our plots to a depth of several inches, then draining off the now saline-impregnated water with the utmost dispatch. Analysis of water run through the river sluices used for leaching showed 9grs. of solids to the gallon. This water was then much discolored in appearance. Twenty-four hours after it had been turned on to the salt area a careful analysis showed an increase of over 400grs. to the gallon, while in one instance rain water which had remained in a shallow pool on section 561 for a few days gave 845·84grs. to the gallon. Nothing further should be required to convince the sceptic as to the positive value of leaching in reclaiming the soil, which is urged as the only remedy for the salt evil in climate similar to ours by all the great agricultural land reclamationists of the day. A 6in. ploughing, leaving the furrows well on edge, will greatly facilitate the leaching process, while at the same time if the land is left idle for, say, six months afterwards it will be materially improved in its mechanical condition by the weathering it receives. Where it is not intended or is not necessary to leach, the soil if urgently required for cropping should be ploughed as lightly as possible, thoroughly cultivated, and worked down with a smoother or leveller, sown with barley or oats for a winter crop, or sorghum, maize, or millet for summer fodder, then roll with a heavy roller to firm the soil. The object in shallow cultivation is to permit

the young plant life to germinate in the surface soil, which has been sweetened or aerated by the sun, rain, and frost since its reclamation. This appears to be the practice adopted elsewhere on such land. From Holland we are warned not to plough deeply after reclamation in the first-coming year, or anyhow, work deeply, but only superficially. Where and when possible, work all reclaimed land as the good farmer does his fallow is the best advice I can give you. For starting summer crops it may be necessary to flood the plot, although it is always desirable to let the rain or stored moisture in the soil do the work if possible. After the outlets to the subdrains have been closed down thoroughly saturate the planted area, then promptly open the drains and allow the surplus water to carry off the excess salts which it has assimilated in its downward percolation through the soil. Sub-irrigation or soakage from the channels and drains across the planted plots is not recommended for young crops, as unless the soil is thoroughly free from alkali the seepage forces the salts to the surface in the centre of the lands, where it shows up either as a dark-colored alkali or as a white efflorescence. Personal tests of some of the cleanest of the Mobilong swamp soil in its original condition when used for potting plants gave conclusive evidence of the presence of an appreciable quantity of alkali.

SUCCESSFUL CROPS.

Crops which have proved more or less successful on the reclaimed lands are—*Panicum Crus galli* (on wet or badly-drained soils), barley (Cape or malt), oats, lucerne, *Phalaris commutata*, maize, sorghum, Egyptian millet, onions, potatoes, broad beans, tomatoes, and pumpkins, while other plants have been tried with varying results. After the excess mineral salts have been removed by leaching and drainage, as little water as possible should be used, or as is commensurate with actual crop requirements. With a view of improving the mechanical condition of the soil after the disposal of the surplus alkali, dressings of from 5cwts. to 20cwts. of lime or gypsum to the acre will prove in most instances beneficial. With the immense quantities of plant foods available, as shown by the analysis referred to in the earlier portion of the paper, no artificial or chemical fertilisers will be required for some considerable time ahead.



EXPERIMENTS WITH FUNGICIDES FOR THE PREVENTION OF "STINKING SMUT" (BUNT).

In the New South Wales *Agricultural Gazette* for May Messrs. G. L. Sutton and R. G. Downing furnish an interesting report on their experiments at Cowra last year with different fungicides used for the prevention of bunt (stinking smut) in wheat. In the experiments the seed was infected by being shaken about in a vessel with a quantity of crushed bunt balls until the wheat had the appearance of being covered with soot. Three different varieties of wheat were used in each experiment, viz., Bobs, Comeback, and Federation. The following are the chief points of interest in the report :—

The absolute necessity of removing the unbroken bunt balls from seed grain is confirmed by the results of an experiment carried out by Mr. R. Hurst on the stud plots at the Wagga Experiment Farm during the past season. Some unbroken bunt balls and smutted grain were soaked in a solution of formalin sufficiently long to destroy the bunt spores on the grain. The unbroken bunt balls were then taken out of the solution and crushed up. The contents of the crushed balls were then used to infect some clean grain which was planted at once. The plants resulting from this grain were examined at the proper stage, and it was then found that every plant was smutted, i.e., it contained at least one bunt ball.

The "smutted" grain that had been treated with formalin at the same time as the unbroken bunt balls was also planted and examined. It was found that every one of the resulting plants was entirely free from bunt. This affords conclusive evidence that the solution used to treat the grain and unbroken bunt balls was strong enough to destroy loose bunt spores, though the trial proved it to be entirely ineffective in destroying the bunt spores enclosed in the unbroken ball.

Treatment with a bluestone solution being general among our farmers, a method was sought which would facilitate the removal of the unbroken bunt balls when the grain was poured into the solution. It was learnt from Mr. John Hanns, a mallee farmer, near Sea Lake, Victoria, that the custom of the farmers in his vicinity was to use salt water from the lake near by with which to make the bluestone solution. Excellent results were reported from this practice. As the addition of salt to the bluestone solution would

increase its density, and thus facilitate the removal of the unbroken bunt balls, it was determined to compare this mixture with the other methods under trial.

PREPARATION OF MATERIALS.

The procedure adopted in dealing with the various plots was similar to that of previous years, and was as follows:—

The bluestone (2 per cent.) solution was made by dissolving bluestone in water at the rate of 2lbs. of bluestone to 10galls. of water.

The lime water used was a thin milk of lime, and was made by slaking freshly-burnt lime with water, using about 1lb. of lime to 20galls. water.

The bluestone and salt solution was made by adding as much salt to a 2 per cent. solution of bluestone as the latter would absorb in two hours. The amount of salt absorbed amounted to 33 per cent. For the purpose of this experiment the procedure adopted was as follows:—One pound of coarse salt was suspended in 40ozs. of a 2 per cent. bluestone solution, which was warmed to 140 degrees Fahr. and kept at that temperature for two hours. At the end of this period the blue color of the original solution has changed to a more or less greenish tint. The salt still remaining undissolved was dried and weighed, and was found to be slightly less than 3ozs.

The Bordeaux mixture was made in the recognised way, at the rate of 6lbs. of bluestone and 4lbs. of lime to 30galls. of water.

The salt solution was made by dissolving as much salt in water as the latter would take up.

The formalin solution was prepared by mixing one part (1lb.) of commercial formalin (40 per cent.) in 400 parts (40galls.) of water.

The numbers of bunt plants found in the plots sown with infected but untreated seed show the bunt-liability of the different varieties used in this experiment.

EFFECT OF PICKLING IN PREVENTING SMUT.

As the result of taking an average of the three varieties under each treatment it is found that the different fungicides were efficient in the following order:—

Bluestone and salt with	·8 per cent. bunt plants.
Bluestone	" 2.5 "
Fungusine	" 6.4 "
Bluestone and lime	" 7.2 "
Bordeaux mixture	" 14.7 "
Formalin	" 18.2 "
Salt water	" 49.2 "

These figures indicate that bluestone and salt, bluestone, fungusine, and bluestone and lime are satisfactory "smut" preventives. Because of its satisfactory behavior in previous years formalin must also be included. The low position held this year by formalin is due to the result obtained when Federation wheat was treated with it. The results in this case appear abnormal, even after taking into consideration the latitude which field experiments of this character apparently demand.

Though the results from the Bordeaux mixture are not very satisfactory, further trial with it is desirable, for the results are better than those of formalin, which past experience has shown to be a satisfactory bunt preventive.

Salt water has proved entirely unsatisfactory, and the results obtained confirm those of Mr. McAlpine. Treatment with salt water may be considered as being quite unsuitable.

An extension of this section was carried out to ascertain whether a longer immersion in bluestone than the usual one would be more effective in destroying the bunt spores on the seed. Different portions of smutted seed were immersed in bluestone for 5, 15, 30, and 60 minutes respectively and then planted. The results show that nothing is gained by immersing the seed for longer than five minutes. The effect in preventing smut in the resulting crop is practically as good after five minutes' immersion as after 60 minutes.

EFFECT OF PICKLING ON GERMINATION.

This trial was conducted with three varieties. Five hundred seeds of each variety were treated by the different methods being tried. The seeds were treated at the same time, and after being treated were dried in the sun and then planted on the same day.

On comparing the averages of the results of the three varieties it is found that the treatment with—

Bluestone apparently kills 30.2 per cent. of the treated grain.

Bluestone and lime apparently kills 10.2 per cent. of the treated grain.

Bluestone and salt	"	8.7	"	"
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Salt water	"	8.4	"	"
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Formalin	"	3.8	"	"
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Bunt spores (only)	"	2.5	"	"
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Bordeaux mixture	"	.8	"	"
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Fungusine	"	— 1.3	"	"
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It appears that fungusine assists rather than retards germination. The actual number of plants which grew from seeds treated with it was greater than of those which grew from untreated seed; but from this it does not

follow that fungusine improves the vitality of the seed grain. A reasonable explanation of this case seems to be that fungusine does not injure the germinating power of the seed, and that its effect is to protect the seed grain from those field pests which (as these experiments show) attack and destroy it.

Because of its ability to destroy smut spores, combined with its non-injurious effect upon the vitality of the seed grain, treatment with fungusine appears to be one of the most satisfactory methods for the farmer to adopt.

Bordeaux mixture had very little injurious effect upon the seed grain, but its value to the farmer in this respect need not be considered, because it has, up to the present, shown itself to be only an indifferent preventive of bunt.

Under the favorable conditions prevailing when the experiment was conducted formalin proved to be only slightly injurious. Former experiments have, however, shown that when the conditions at planting time are dry and unfavorable for germination its injurious effect is very much increased. This fact lessens the value of formalin for the prevention of smut in our wheat districts, where the conditions at planting time are often dry.

The destructive effect of bluestone is again apparent, and because of this its value to the farmer is very much lessened, even though it is such a good preventive of smut. The necessity of supplementing it with some ameliorating agent is emphasised by these results. Lime has again proved satisfactory in this respect. The relative results of the effect of the bluestone and the bluestone and lime methods are approximately the same though not as satisfactory as in former years. The mixture bluestone and salt, tried this year for the first time, appears even more satisfactory than the bluestone and lime. The former method has the additional advantage of being more easily practised than the latter, and will displace it if it continues to prove satisfactory in future trials.

Though it is very rarely advisable to make modifications of farm practice because the result of one trial, an exception may be made in this case, as the practice of using "bluestone and salt" has been followed with good results by a certain section of farmers for some time. The addition of salt to the bluestone solution is, therefore, recommended to those who this season propose to use bluestone for pickling their wheat.

The amount of salt which is to be added for best results has not yet been determined, but this will be found out by future experiments. Tentatively it is suggested that the weight of salt added be equal to that of the bluestone. The present experiment shows that it is not injurious to add all the salt that the bluestone solution will absorb in two hours.

Not only is some seed destroyed by most of the methods adopted, but, with the exception of that treated with Bordeaux mixture, the seed which does grow does not germinate as rapidly nor at the same rate as untreated seed.

DOES PICKLING PREVENT REINFECTION OF SEED ?

Seed of the three varieties was treated according to the different methods under trial, and, after being dried, was then infected with bunt in the manner described. The seed after being infected was planted. Plots were also planted with untreated but infected seed in order to ascertain the degree of infection to which the treated seed was subjected.

The ability of the different fungicides to prevent reinfection was determined by the number of clean and bunt plants found in the resulting crop. The larger the proportion of clean the greater the ability of the particular fungicide to prevent reinfection.

The proportion of clean plants was determined by an examination made after the plant had flowered. By taking the average of the three varieties under each treatment it is found that the fungicides are effective in preventing reinfection in the following order :—

Bluestone and salt with 90·0 per cent. of clean plants.			
Bluestone	" 79·3	"	"
Fungusine	" 69·3	"	"
Bluestone and lime	" 67·2	"	"
Bordeaux mixture	" 55·1	"	"
Formalin	" 35·4	"	"

Pride of place is held by bluestone and salt, but its position is largely discounted by the fact that when the examination for the clean plants was made there were very many less plants found growing from the seed treated with this method than from seed treated in any other way. Until additional results are available it appears desirable to ignore those obtained with bluestone and salt this season. This being understood, bluestone ranks first in preventing reinfection.

The advantage of a method which in addition to destroying the smut spores of the seed grain also prevents the reinfection of that grain may not be at first realised. When, however, it is understood that the possibility of treated seed becoming reinfected is very considerable as the result of being placed in old bags or bins, or through machines which have held smutted wheat, the value to a farmer of a treatment which will aid in preventing reinfection is at once apparent.

EFFECT OF PICKLING SOME TIME BEFORE SOWING.

Seed of three varieties was treated according to the different methods prescribed and divided into several portions, which were respectively planted in seed boxes a few days after, a month after, and three months after being treated. For purposes of comparison untreated seeds of the same variety were planted on the first date.

The results obtained are given below. Seed treated on July 14th, 1909; 100 seeds of each variety planted in seed boxes.

*Showing the Effect of Planting Treated Seed at Different Intervals
After Treatment.*

Variety.	Untreated.	Bluestone.			Blues'one and lime.			Fungusine.		
		Planted after Treat.			Planted after Treat.			Planted after Treat.		
		3 days.	33 days.	92 days.	3 days.	33 days.	92 days.	3 days.	33 days.	92 days.
Bobs	88	61	66	39	95	84	78	84	81	81
Comeback	94	62	87	60	92	82	80	86	92	87
Federation ...	100	94	92	89	95	91	96	99	93	86
Average	94	72.3	81.6	62.6	94	85.6	84.6	89.6	88.6	84.6

These results are not entirely consistent, but taken in a general way they indicate that the seed can be treated at least three months before it is required without incurring much risk of loss.



STOOKING HAY AT ROSEWORTHY.

SOIL FERTILITY.

The following extract from the report of the Secretary of Agriculture of the United States Department of Agriculture for 1901 will be read with interest—"A great and fundamental problem which has confronted our people, as it has the people of the world, is the question of the permanency of soil fertility. Of late years particularly the idea has prevailed that the soils of various parts of the United States are wearing out through loss of mineral plant food, and that a serious condition is thus presented for the future of our people. So important and fundamental is this problem for the welfare of our people that I directed a thorough examination to be made of the whole subject; and an exhaustive report has been issued, from which certain important conclusions can be given in a few words. It has been found from the records kept by our own department that, on the average, crop yields per acre have shown a decided tendency to increase during a period of 40 years, and that there is no evidence of general decrease over large areas or in any particular State, as is popularly supposed. This indicates undoubtedly that on the average our people are farming more intelligently, and therefore more successfully, and that we are through these more intelligent methods winning gradually larger returns from the soil. It has been held, however, by some writers, that even if the yields are increasing, the element of danger is that the larger crops remove larger amounts of plant food from the soils, and bring nearer the time when the soils will eventually wear out. To meet this argument it has been necessary to extend the investigation into older countries, and the records of Europe have been searched for information in regard to the past history of these older countries that can be taken as a safe guide for the future of the newer soils of the United States. These records indicate that in the middle of the sixteenth century, or, roughly speaking, 300 to 400 years ago, the soils of Central and Northern Europe were producing on the average about as much wheat as the soils of the United States are producing at the present time. These European soils have been occupied for agricultural purposes for at least a thousand years, during most of which period the country was more densely populated than the United States is at the present time. So far as records are obtainable, they indicate that as a result of increasing population and more intensive and more intelligent methods of soil control, and in spite of their longer occupation, the average yield per acre has increased, until in the case of Northern Europe, the soils are now producing about two or two and one half times as much per acre as the newer soils of the United States are producing. In addition to this evidence of actual crop yields per

acre, an exhaustive investigation has been made of soils for the last 18 years in certain countries of Northern Europe in which crop yields have been increasing, and likewise the soils of the United States, including the older soils of the Eastern States and the newer soils of the Western States. The results of these analysis, published side by side, show no significant difference in chemical composition between the older soils of Europe and the newer soils of the United States. Microscopical examinations of the soils fail to show that the longer occupation of the soils of Europe has changed noticeably the mineralogical character of the soils. It is reasonable to infer from the work that has been done that within historic times the occupation of the soils for agricultural purposes has failed to noticeably change the mineral character of the soil material upon which the future life of the nation must ultimately depend. The reasons for this and the laws of nature which permit the soil thus to be continuously occupied and used for mankind as freely as the air, are complicated and difficult to understand, and offer a profitable field of research for our agricultural colleges and experiment stations."

THE EFFECT OF FIRE ON SOIL FERTILITY.

In this State the necessity for burning the scrub on so much of our farm lands, as well as the stubble for the first few years, has naturally directed the attention of observant farmers to the effect of the fire on the succeeding crop. The beneficial effect of a good burn of either scrub or stubble is well recognised, and more often than not this has been attributed to the potash in the ashes. The fact, however, that our mallee ashes are very low in potash contents, and not infrequently the light ash is blown away before the land is cultivated, in addition to the general failure of applications of potassic manure to give satisfactory results has proved that there is some more important factor to be considered. If any mineral constituent of the ashes were this factor it would more likely be lime, as our mallee ashes contain up to 45 per cent. of lime. Some observers have attributed the results from a good burn to the destruction of insects and weeds, and also to the physical effect of the fire on the soil. In the April issue of the *Journal*, page 791, Mr. Herbert, of Nantawarra, reports having tested this by scattering unleached wood ashes on one

plot of ground, and burning rubbish on a plot alongside, with the result that there was much better growth on the latter plot.

Some interesting light is thrown on this subject by experiments carried out during the past two years at Rothamsted Experiment Station, England, on the effect of partial sterilisation of the soil on the production of plant food. In these experiments Messrs. E. J. Russell and H. B. Hutchinson found that in soils heated for two hours to a temperature of about 180° F. there was found later on a decided increase in the ammonia produced by the decomposition of soil substances by bacteria. Pot experiments showed that there was also an increase in the fertility of the soil so treated, and this increase was attributed by the experimenters to the increase in the amount of ammonia produced in the sterilised soils. The first effect of heating the soil is to reduce the number of bacteria present, but within a short time these rapidly increase in number, until they become more numerous than was originally the case. In addition to the bacteria which produce nitrogen, other organisms (*protozoa*), two of which are known to destroy bacteria, were always found in the untreated soil, but did not exist in the partially sterilised soil. It is believed that these destructive organisms are killed by heating the soil, with the result that the ammonia-producing bacteria, having practically a free field for their work, become more numerous and vigorous.

Writing to *Nature* on this subject, Dr. Bernard Dyer, the well-known agricultural chemist, remarks—"Some of the growers of cucumbers, tomatoes, etc., under glass for the London market, have for some little time adopted the plan of injecting jets of steam into their soil before planting, not with any view of increasing its fertility, but with the view of destroying slugs, insects, &c. In the experience of some growers the productivity of the soil, after steaming, has become so greatly increased that, if anything like the usual quantity of stable manure is mixed with the soil, the plants grow with such rank luxuriance as to spoil their bearing capacity, exhibiting all the symptoms that would be expected as the result of a heavy overdose of nitrogen. This experience has been communicated to me by growers who were previously unaware of the Rothamsted work. At the moment they were feeling in somewhat of a dilemma; if they did not steam the soil they suffered from insect pests; if they did steam it they were obliged to curtail the supply of stable manure at the expense of lowering the subsequent soil temperature, which is normally maintained at a high level by the fermentation of the manure. No doubt means may be found of adjusting the various conditions satisfactorily, but meantime the observation appears to afford striking independent confirmation on a practical scale of the indirect fertilising effect of partial sterilisation in killing off the phagocytes or protozoa, which normally keep down the numbers of those bacteria, the task of which is to turn organic nitrogen into plant food.

EXPORT OF DUCHESS PEARS.

In previous issues reference has been made to the efforts of the South Australian Fruitgrowers' Association to ship to London the pear known locally as the Duchess (Williams' Bon Chretien). By the Orient s.s. *Orvicto*, which left Port Adelaide on January 27th, the association sent forward about 250 cases of Williams' Bon Chretien, 50 Durondeau, and five Gansell's Bergamot pears. In the same boat the West Australian Association shipped 54 cases of Williams' pears. The Acting Trade Commissioner cabled, on the arrival of the boat, that the pears were in good condition, and he anticipated an average return of 12s. per case. On opening up the fruit, however, some was found to be over-ripe. Further, in nearly all the consignments one case of the fruit would open out quite green and the next yellow, while in one case the pears on one half of each tray were good and on the other side over-ripe. As buyers refused to accept "yellow fruit" the prices did not average out as well as anticipated; but still, with the exception of two brands which, on the whole, were over-ripe, prices were fairly satisfactory. Both the Durondeau and the Gansell's Bergamot carried well and realised about the same prices as the Williams'.

The prices realised in London for the different consignments were as follows :—(a) 20 cases, 11s. 9½d.; (b) 20 cases, 8s. 7d.; (c) 73 cases, 13s. 2½d.; (d) 25 cases, 8s. 10½d.; (e) 50 cases, 11s. 5d.; (f) 25 cases, 10s. 6d. One consignment did not go through the Produce Depot, and consequently prices are not available; but the balance, including the over-ripe fruit, averaged 11s. per case London, equal to 4s. 9d. per case net to grower, less cost of freight to Port Adelaide.

As prices for these pears average from 2s. 6d. to 3s. 6d. per case in years of heavy crops, and 3s. 6d. to 5s. in a bare season, these returns are decidedly encouraging and warrant further shipments. The pears sent by the West Australian shippers average about 7s. 2d. per case net at Fremantle; but, apparently, the cases were somewhat larger than ours, as the fruit therein weighed about 45lbs., whereas it is doubtful whether ours exceeded 38lbs. This fruit had the advantage of five days' shorter voyage and was apparently larger than those shipped from South Australia. Prices ranged from 10s. 6d. per case to 19s. 6d. per case.

Cape Colony sends large quantities of pears to London, but the voyage is only about half as long as that from Australia, and the pears are more advanced and larger than it would be safe to ship from here. In January of the current year the Cape shipped 7,860pkgs. of pears to London, and in

February, 42,988. A considerable proportion of these consisted of Williams' and Clapp's Favorite. Some of these later shipments would, doubtless, come on the market at the same time as our pears, as the Acting Trade Commissioner mentions that the previous week about 30,000 trays of Cape pears, carrying 24 to 28 fruits to a tray, arrived. Mr. Pope states that the average price for good fruit going 24 to the tray is about 3s., and for smaller fruit 2s. 6d. per tray. The South African fruit is practically through by the middle of March, and if we could ship from our latest districts about the second week in February we would probably realise better prices.



ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the above Board was held on Wednesday, May 11th, there being present Messrs. J. W. Sandford (chair), Colonel Rowell, W. J. Colebatch, C. J. Valentine, C. J. Tuckwell, R. J. Needham, T. N. Hardy, G. R. Laffer, and C. Willcox, also Mr. J. Sandow, late of Koolunga Branch.

In reply to request for information concerning his investigation into the outbreak of takeall at Port Pirie, Professor Angus wrote—"What happened in the case of Port Pirie has taken place over and over again in other districts—namely, that an intimation of a serious outbreak was given to the Department, and an officer was sent up to gather information and to take samples of the infected crop. These samples were sent to Mr. D. McAlpine, and the disease identified as *Ophiobolus graminis*, just as in the case of many other samples sent by us to him during the past five years. In the report of Mr. McLean and also of the Secretary of the Port Pirie Branch of the Agricultural Bureau nothing of value bearing on the outbreak could be gathered, as the opinions of the farmers regarding the conditions responsible for the outbreak were absolutely contradictory."

In reply to inquiry Mr. Summers said that so far as he knew no experimental work in connection with this disease was being conducted in any of the States, and as far as preventive measures were concerned they practically knew no more than was known 10 years ago. In reply to question by the Chairman Mr. Sandow said of late years he had not been much troubled by takeall, and he attributed this to the system of fallowing and working the land only when damp. He said they got takeall in the crops when a fairly long wet spell was followed by hot weather. In the early days they had a great deal of takeall at times, but then they were cropping the ground four or five years in succession.

Mr. Colebatch said one difficulty that existed in coming to any conclusion on reports from farmers was that the latter did not distinguish between takeall caused by fungus attack and takeall due to climatic and other causes. The result was that reports received often were quite contradictory of each other. He said the present position was a strong reason why they should support the endeavours of the Department to have appointed a micrologist who would devote himself solely to the investigation of fungoid and kindred diseases.

Mr. Summers said on two separate occasions within the past six years when takeall had been prevalent in parts of the south it had occurred after a long, cold spell when the crops were practically at a standstill for some time; in both cases the trouble had been due to fungus.

Mr. G. R. Laffer considered that there was a wide field for the employment of an expert vegetable pathologist. Only last night he had been informed that owing to the serious epidemic which had wiped out the potato crop at Brownhill Creek last season, when 100 tons of seed had been planted, there would be practically no potatoes sown this year. If the growers in other parts should follow the example of the Brownhill Creek men it was almost certain that the price of potatoes would be abnormally high, and not only the producers but the consumers would suffer. Then there was bitter or brown pit in fruit. This year what seemed to be the same disease had made its appearance in pears. So far as he could learn it was more widespread to-day than it had ever been before. He felt strongly that the State should take this matter up.

At the instance of Mr. Wilcox it was decided to recommend "that it is desirable in the interests of the producing community that a Professor of Vegetable Pathology should be appointed to inquire into and report upon fungoid and similar diseases."

The Secretary reported that arrangements were being made for a Conference of Upper North Branches on June 22nd and June 23rd at Orroroo.

The Secretary reported that Messrs. J. and R. Forgan had expressed their willingness to exhibit their stone-gatherer at the September show, and also to give a working trial at Roseworthy College farm on Farmer's Day.

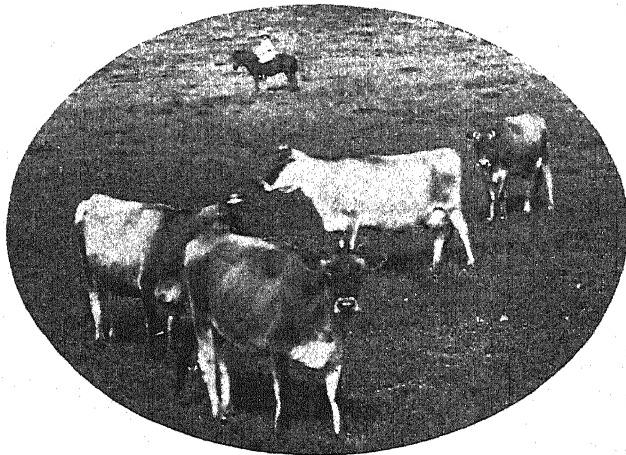
The following members were approved at members of the undermentioned Branches:—Messrs. G. Bennett, M. Kennedy, W. J. Hemmings, and L. R. Davies, Kalangadoo; J. A. Marles, Meningie; B. A. Noltenius, G. A. Price, T. and J. Allen, Yallunda; W. Bowman and C. F. H. Borgas, Wirrabara; A. Heinze and G. McLean, Parrakie; H. W. Lawrence, Lyndoch; T. Rice, Colton; P. T. Hill and C. Read, Georgetown; A. March and C. Matthews, Clarendon; P. Fox, W. Davey, and T. Muddock, Belalie North; A. Kindly Johnsburg; W. T. McLean, W. Gordon, I. J. Williams, and O. Ingiis, Shannon; E. Twartz, Sutherlands; H. W. Norsworthy and A. W. Cornish, Gumeracha; F. Marrett, J. Watson, and E. H. Holgrave, Northfield; F. G. Thomas, Mount Bryan East; C. F. W. Kleemann, J. Blake, G. Lane, E. Nelson, and E. W. Stecker, Murray Bridge; H. H. Nicholls, Narridy; T. R. V. Berriman, Mannum; J. A. Short, Salisbury; and W. Dall, Keith.

Mr. Tuckwell referred to the recent report of the Assistant Comptroller-General of Customs, in which it was suggested that the amount of moisture in butter intended for export should not exceed 14 per cent., and the fact that the various factories had been invited to communicate their views on the matter. For superfine butter 14 per cent. had always been regarded as the maximum, but he did not think it would be well to make this apply to all grades of butter for export. In England the limit was fixed at 16 per cent. Australia and New Zealand had a reputation for the dryness of their butter, but much as they would all like to see the standard maintained, the conditions which often prevailed during the hot weather rendered it impossible to make

up butter from much of the cream with as little as 14 per cent. of moisture. He proposed "that in view of the report of the Assistant Comptroller-General of Customs containing a recommendation that the proportion of water allowed in butter be limited to 14 per cent., an early report be obtained from the Dairy Expert (Mr. Suter) regarding the possibility of making from heated cream butter containing less than 16 per cent. of water, as it is impossible for some cream suppliers living at a distance from the factories to send cream in good order during the summer."

Mr. Sandford was glad that Mr. Tuckwell had brought the matter up. During extremely hot weather the cream in transit absorbed so much heat that it was impossible to churn without refrigerating or using iced water, the effect of which was to immediately seal up each globule of fat. Although the butter was worked a second time with a view to express as much of the water as possible, with such cream it was always most difficult to get rid of the moisture. If the authorities should determine to prevent the exportation of the second and third grade butters it would be a serious thing for those farmers away out, whose cream necessarily suffered during transit over long distances in hot weather.

The motion was carried.



ANALYSES OF BLUESTONE.

In order to ascertain the extent (if any) to which inferior bluestone was being sold in the country districts, the late Minister of Agriculture (Hon. T. Pascoe, M.L.C.) instructed that samples be obtained from different districts for analysis. A number of members of the Agricultural Bureau were requested to send in samples from supplies purchased in the ordinary way. In the following table are shown the results of analyses of these samples :—

No.	Name.	Locality.	Copper Sulphate.
			Per cent.
A	J. A. Mattiske	Freeling	99.5
B	A. Miell	Crystal Brook	99.5
C	J. McColl	Kingswood	99.3
D	C. H. Meyer	Dawson	99.1
E	W. J. Gleeson	Carrieton	98.8
F	W. R. Stephenson	Kainton	99.3
G	S. F. Potter.....	Yarandale.....	99.3
H1	D. A. Collins	Mount Gambier	98.8
H2	D. A. Collins	Mount Gambier	99.0
I	W. T. Vigar	Rhine Villa	98.4
J	W. Bennier	Penong	98.2
K	A. Tavender	Lucindale	98.6
L	P. T. Bell	Kingscote, K.I.	98.2
M1	J. Florence	One Tree Hill, K.I. ...	98.2
M2	J. Florence	One Tree Hill, K.I. ...	98.1

From the above it is evident that there is little to complain of in respect to our supplies of bluestone. A few of the samples might have been better, but all of them would give effective results as fungicides. The only likely adulterant of bluestone (sulphate of copper) is the cheaper sulphate of iron, but when this is present in any quantity there would be an absence of the deep blue color characteristic of bluestone crystals.

AID TO AGRICULTURAL AND HORTICULTURAL SOCIETIES AND TO
SOCIETIES FOR FIELD TRIALS OF AGRICULTURAL IMPLEMENTS.

Office of Minister of Agriculture, Adelaide, May 27th, 1910.

Notice is hereby given that the sum voted by the Legislature for the year 1909-10 in aid of the funds of the above societies has been apportioned as follows.

T. PASCOE, Jun., Minister of Agriculture.

Name of Society.	Amount.	Name of Society.	Amount.
	£ s. d.		£ s. d.
Angaston	19 12 0	Murray Bridge	17 9 0
Balaklava and Dalkey ..	37 3 0	Naracoorte	35 13 0
Belalie	39 14 0	Northern.....	23 0 0
Booyoolie	32 10 0	North-Western	37 15 0
Burra and North-Eastern	25 13 0	Northern Yorke Peninsula (field trial)	15 0 0
Central Eyre's Peninsula	13 6 0	Onkaparinga	19 19 0
Central Yorke Peninsula	40 2 0	Orroroo	17 19 0
Charra, Denial, and Murat Bay	7 19 0	Penola	29 14 0
Clarendon	10 18 0	Penong	6 15 0
Eudunda.....	20 18 0	Petersburg	21 12 0
Franklin Harbor	8 15 0	Port Lincoln.....	7 6 0
Gawler	61 5 0	Port Wakefield	14 5 0
Great Flinders	19 5 0	Robe	14 16 0
Great Western	7 2 0	Snowtown.....	27 9 0
Kapunda and Light	34 11 0	Southern	24 4 0
Kingston.....	14 12 0	Southern Yorke Peninsula	30 5 0
Lake Albert	16 19 0	Stanley	34 2 0
Lucindale	13 4 0	Strathalbyn	30 17 0
Maitland	34 0 0	Streaky Bay	12 8 0
Mannum	18 19 0	Swan Reach	10 3 0
Meadows	19 2 0	Tatiara	27 3 0
Midland	34 10 0	Two Wells Amalgamated..	31 16 0
Mid Murray	6 6 0	Upper Murray	9 17 0
Millicent	24 10 0	Willunga	20 8 0
Moonta	39 16 0	Wilmington	16 8 0
Mount Barker	41 18 0	Wooroora	20 14 0
Mount Gambier	52 9 0	Yankalilla.....	20 6 0
Mount Pleasant	34 1 0	Yorke Peninsula	43 18 0

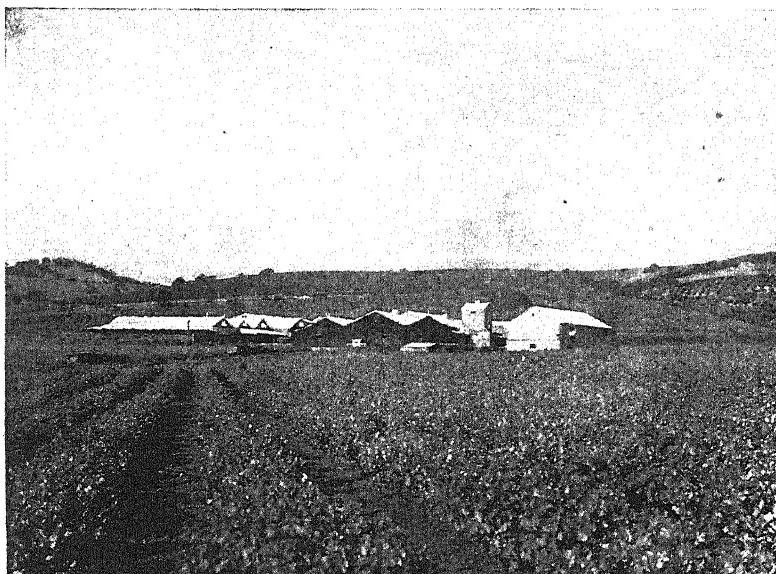
CO-OPERATION AMONG APIARISTS.

It is gratifying to all concerned to note that the system of co-operation so strongly advocated by the Trade Commissioner (Major A. E. M. Norton) is bearing fruit, and promises to put at least one of the State's industries on a firm footing. It is well known that the beekeeping industry of this State prior to the opening of the London market had reached a state of stagnation, due to the production of honey far in excess of the requirements of the local and inter-State markets. This glut, and the consequent low prices, made beekeeping unprofitable. The opening of the trade with London, by means of which the State was relieved of considerably over 100 tons of honey per annum during the past three years, has had the effect of increasing the price of honey to the producer on the local market, with the result that the apiarist is receiving a payable return for his work. One important feature in connection with the London trade is the fact that the shipper cannot raise the price of honey for shipment oversea above 2½d. per pound f.o.b., without curtailing if not altogether killing the demand. When the London trade was first established, the price returned to producers who supplied honey for shipment was 2½d. per pound f.o.b., and apiarists generally expressed the opinion that the return was a payable one. The removal from local competition of this large quantity of honey, of course, raised the price in South Australia very considerably, with the result that the return for local sales very soon became higher than the 2½d. f.o.b. obtained for shipment parcels. It was obviously unfair to expect some of the more liberal-minded apiarists to ship their produce, and thus create the higher market for those beekeepers who hung back for the better price. As the London trade had to be kept going by continuous supplies, it was soon realised that unless producers each bore their share of the export requirements, the demand from that source would collapse, and all the energy and expense exerted in creating the market would end in nought. The glutting of the market with the large quantity of honey which was to be shipped to London would have brought about the same unprofitable state to the beekeeper as existed prior to the establishment of the oversea trade.

The only hope lay in co-operation, and with this idea in view the South Australian Beekeepers' Association formed itself into a limited company, under the style of the South Australian Beekeepers' Co-operative Union, Limited. The objects of this union are, briefly, the marketing of members' honey and other produce of the apiary at the best price on the local, inter-

State, or oversea markets, and the procuring for members of all supplies needed for the apiary at the lowest rates possible. The Union's store at Port Adelaide has been open for the reception of members' honey since the beginning of the present year, and the interest taken in, and encouragement given by beekeepers to the project, is commendable, and shows that they are well alive to their own interests. A pleasing feature in connection with the Union is the fact that the Government are fostering its development and operations.

The ordinary general meeting of members is to be held on the 11th July, and on the evening of the same date the secretary has arranged for an open meeting of those interested in the industry, at which papers relating to the conduct of the apiary will be read, and questions and discussion on points of interest invited. As the meeting is accessible to the general public as well as to the members of the union, a large attendance is anticipated. Full particulars regarding the meeting, as well as details respecting the union, etc., will be supplied on application to the secretary (Mr. H. J. Finnis), at Victoria Buildings, Victoria Square, Adelaide.



VINEYARD AND WINE-CELLARS.

FOUL BROOD.

By NEMO.

That the presence of the contagious disease amongst bees known as bee pest, or foul brood, is not of recent origin, is shown by the fact that ancient writers of the early Christian era made allusions to the ravages of a disease prevalent amongst bees. At the present day it is more formidable and devastating in its effects, owing to the advance of civilisation with its modern methods. The up-to-date system of bee-keeping with movable comb hives, with the interchangeability of bees, hives, and appliances, aid in the ready detection and treatment of the disease in its initial stage when handled by competent beekeepers. When these methods are adopted by careless, indolent beekeepers the reverse happens, then indiscriminate manipulation and interchange of movable appliances is not conducive to the retarding of a highly infectious disease.

This disease—which also attacks the adult insect—shows the effect of its ravages amongst the immature larvæ in the brood combs. Two types of the disease are generally recognised, one mild in effect, which attacks unsealed larvæ, and a more virulent form, which attacks the larvae after they have been sealed up in the cell. The appearance of healthy larvæ is well known to bee-keepers—the white, plump, well-fed appearance as they lie curled up in the bottom of the cells in compact series.

The first symptom of disease is shown by the grub assuming an unnatural position, often presenting the dorsal surface to the observer. An unusual restlessness evident in the colony will sometimes lead to its detection. The larvæ commence to have a flaccid, unhealthy look, and a faint yellow tinge overspreads the pearly whiteness of their skins, deepening, as the germs increase, to a dark coffee color; the grub dies, its body shrinking by evaporation and decomposition to a dark brown residue adhering to the lower cell wall. The decaying matter is of a tenacious nature, and on attempting its removal it will stretch out in strings. This elasticity is due to the tracheæ, or breathing tubes, which ramify the body, being of a chitinous nature, and not readily decomposed. Should the larvæ escape infection until near pupahood, the cells are capped over in the usual manner, and the disease on attacking the sealed larvæ only shows its presence by the capping becoming darker in color, having a sunken appearance, and often pierced with an irregular hole. The latter type of disease is undoubtedly more virulent and destructive, being usually associated with an extremely characteristic odor somewhat similar

to offensive glue. This odor, however, is not always present in equal intensity, and varies with the phases of the disease.

Bees having a low vitality—weak, and ill-cared for—present an easy prey to the disease germs. The seat of the trouble is the alimentary canal, where the minute micro-organisms are found in large numbers, spreading at a later stage into the blood and fat tissues of the larvae.

Much controversy has ensued with regard to these micro-organisms, owing to the extreme difficulty of the process of staining, microscopic examination with high powers, and eliminating from one another the various microbes that are found in bees. This points to the conclusion that present-day knowledge regarding the character and habits of these germs, and their relation to disease in bees, must always be open to revision, as further investigations reveal more light on the subject. Micro-organisms are the cause of infectious diseases, fermentative and putrefactive changes, and are known under the scientific name of "Schizomycetes," owing to their method of reproducing their kind by splitting or fissuration. Micro-organisms, which can grow and multiply in the tissues of an animal, are pathogenic or disease-producing to that animal.

Bacilli and micrococci chiefly concern us in the investigation of foul brood. The former are rod-shaped and reproduce by elongation, splitting at a certain point into two portions, which continue the process of reproduction. On occasions, the separation does not always occur, and a line of bacilli in form similar to a string of sausages create which is called a lepto-thrix. Certain bacilli, when nutriment is withheld, are capable of forming into ovoid spores or seeds, which possess a stronger vitality, resisting to a very great extent freezing, boiling, and chemicals. They often possess at their posterior end extremely delicate filaments, called flagella, which act as organs of locomotion to propel them through the blood and tissues of the insect. Micrococci are minute globular germs which propagate by growing slightly longer, forming an indentation in the middle creating a dumb-bell appearance. This grows more pronounced, and separation eventually occurs.

The fact that spores of bacilli and micrococci are similar in shape, renders microscopic investigation a matter of difficulty. Three micro-organisms are pathogenic to bees in connection with foul brood, being present in different phases of the disease ; *Bacillus alvei*, Cheshire ; *Bacillus Brandenburgiensis*, Maassen (syn. *B. Burri*, *Burri*; *B. larva White*) *Streptococcus apis*, Maassen (syn. *B. Güntheri*, *Burri*). Investigation points to the fact that one or other of these organisms is ever striving to predominate.

B. alvei and *streptococcus apis* are found together in the mild type of foul brood, in varying numbers, each fighting for mastery. When *streptococcus apis* is in ascendancy, the disease is more similar to sour brood, and has a smell like sour paste. When *B. alvei* is dominating, the decayed matter has the ropiness that is characteristic of foul brood and an odor

similar to human perspiration. *Bacillus Brandenburgiensis* is only present when the disease attacks sealed larvæ, and is often associated with the others; and whenever it has assumed the strongest hold the disease is more rampant. This bacillus seems unable to obtain a hold in the intestine of the young grub, but makes more progress in the fatty tissues of the mature body. The change from larva to pupa seems to give it an opportunity to invade the alimentary canal, and death ensues after the larva has been sealed over. These bacilli average in length about 1-6,000 part of an inch, with a diameter of about 1-40,000 in., and have to be examined with a microscope of exceedingly high power.

Competent beekeepers who have had both a practical and scientific acquaintance with the nature of the disease are able to cure it, but it must be admitted that an easy and certain cure that is inexpensive, with little loss to the bee-keeper, requiring only an elementary knowledge of bee-keeping for its application, has yet to be discovered. To detect the disease in the initial stages, when the bacilli have only commenced their inroads on the grub, places successful treatment nearer our reach. Later, when the bacilli have exhausted the nutriment in the larva and commence to form into spores—seeds capable of greater resistance, and when placed again in contact with nourishment will reproduce bacilli—the disease is undoubtedly more difficult to cure.

A cure that is fairly simple, and has proved efficacious in most cases, is as follows:—Towards sundown remove the diseased colony from its stand, placing an empty inverted box in its place, with a large sheet of paper beneath it. The bees are shaken from their combs on to the paper and allowed to run in. The paper receives any infectious droppings, and is afterwards gathered up and burnt. The ground should be turned over and dug in.

The combs are melted to wax and sterilised. The hive is carefully cleaned and disinfected by scorching with a painter's blow lamp. The frames and cloths are burnt. After three or four days, when the bees have utilised all the honey from the old hive in building wax in the empty box, they are returned to the old hive on to new, clean combs, or wax foundations. The contents of the box are destroyed. Killing the old queen and introducing a young vigorous one assists in making this cure more certain. Some bee-keepers prefer to confine the bees in the box with ample ventilation until they have exhausted their honey, and then return them to the old hive.

Within the limits of an article of this description it is impossible to deal with all the details connected with this disease, and the methods that are used in curing it. A vast field of discovery awaits the explorer who wishes to investigate the many diseases, infectious and otherwise, that affect the bee.

THE WHEAT MARKET.

A very heavy fall in wheat occurred in May, the price dropping gradually from 3s. 8d. per bushel to 3s. Our principal cereal has not touched such a low figure for over three years; at the beginning of April, 1907, the Adelaide price was 2s. 11½d. The chief consolation for growers is that bedrock seems to have been reached, and on June 7th there was a slight recovery to 3s. 2d. a bushel. There is no doubt that a very large stock of wheat still remains unsold in the stack or in farmers' hands, because, owing to prosperous circumstances, many growers declined to sell the bulk of their crop even when 4s. a bushel could be obtained in most country markets. The big drop is therefore to us a matter of national importance.

The reasons for the fall appear to be various, but the determining factor is probably the fine Russian crop of last year, and the generally good prospects for the coming season. "With the exception of some of the winter wheat States in America," says *Beerbohm's Evening Corn Trade List* of May 6th, "where prospects are worse rather than better, the crop outlook generally is quite satisfactory, Russia, especially, sending very favorable reports during the past week. There is some difference of opinion as to whether that country still holds very large reserves; but, if the official estimate of the last crop was correct, there is a large quantity of wheat still to come forward. It would appear to still depend mainly on the amount shipped from Russia during the rest of this season whether the supplies available will exceed requirements to any serious extent or not."

Great Britain's requirements from abroad for the year 1909-10 were, on May 6th, estimated at about the same as the previous year (26,300,000qrs.); but the quantity afloat and due before July 31st was 4,000,000qrs. as against 2,950,000qrs. in 1908-9; and the balance required for the year ending July 31st, 1910, was only 6,400,000qrs. as against 8,820,000qrs.

Again, Germany, which is the chief importing country after Great Britain, has been importing so largely in the early months of this year that her estimated requirements were on May 1st only about half what they were at the same date of 1909. All these facts have doubtless tended to depress the market, in spite of the small shipments from Argentina, due to the comparative failure of last season's wheat harvest. How severely the crops of that country suffered is shown clearly by the statement that from August 1st, 1909, to May 1st, 1910, her exports of wheat and flour to Europe were only 4,024,000qrs., as against 9,913,000qrs. during the same period of the previous year. The ruling factors, however, have been the great inrush of wheat from Russia, owing to the bountiful harvest reaped there in 1909, and the favorable reports respecting the crop in America.

The export from Russian and other Black Sea ports to Western Europe in the period mentioned (August 1st, 1909, to May 1st, 1910) reached the great total of 21,750,000qrs. as against 9,913,000qrs. for the same period of the previous year.

Date.	LONDON (Previous Day).							SYDNEY. Per Bushel.						
	ADELAIDE. Per Bushel.			MELBOURNE. Per Bushel.										
May 9	March 4/6 (sailor)	..	..	..	..	..	..	3/7½ to 3/8	..	..	..	..	..	..
10	Quiet	..	..	..	..	..	..	3/10 mill siding	..	..	..	..	..	..
11	Dull	..	..	..	..	..	..	3/9½ ex siding	..	..	..	..	..	..
12	Do.	..	..	..	..	..	..	3/7 to 3/8	..	..	..	..	..	..
13	Depressed	..	..	..	..	..	..	Do.	..	..	..	..	..	..
14	—	..	..	..	..	..	..	Do.	..	..	..	..	..	..
15	Easier	..	..	..	..	..	..	Do.	..	..	..	..	..	..
16	April 4/3½ (sailor); March 4/4½ (steamer)	..	..	..	..	..	..	Do.	..	..	..	..	..	..
17	Dull; easier tendency	..	..	..	..	..	..	3/7 to 3/7	..	..	..	..	..	..
18	—	..	..	..	..	..	..	3/6 to 3/7	..	..	..	..	..	..
19	Dull	..	..	..	..	..	..	Do.	..	..	..	..	..	..
20	—	..	..	..	..	..	..	3/9	..	..	..	..	..	..
21	—	..	..	..	..	..	..	3/6	..	..	..	..	..	..
22	Dull	..	..	..	..	..	..	3/4½	..	..	..	..	..	..
23	4/2 afloat	..	..	..	..	..	..	Do.	..	..	..	..	..	..
24	4/1½ afloat	..	..	..	..	..	..	3/3½	..	..	..	..	..	..
25	4/1½ off coast; 4/1¾ Liverpool (saier)	..	..	..	..	..	..	3/3 to 3/3½	..	..	..	..	..	..
26	4/0¾ afloat	..	..	..	..	..	..	3/2	..	..	..	..	..	..
27	3/9¾ afloat	..	..	..	..	..	..	3/2 to 3/2½	..	..	..	..	..	..
28	3/10¾ (off coast)	..	..	..	..	..	..	3/1 to 3/1½	..	..	..	..	..	..
29	3/10¾ (off coast)	..	..	..	..	..	..	3/-	..	..	..	..	..	..
30	—	..	..	..	..	..	..	3/1½	..	..	..	..	..	..
31	Dull	..	..	..	..	..	..	3/3	..	..	..	..	..	..
June 1	3/9 to 3/9½ (off coast)	..	..	..	..	..	..	3/3	..	..	..	..	..	..
2	3/9¾ afloat	..	..	..	..	..	..	3/-	..	..	..	..	..	..
3	3/10¾	..	..	..	..	..	..	3/-	..	..	..	..	..	..
4	3/10¾ (off coast)	..	..	..	..	..	..	3/-	..	..	..	..	..	..
5	—	..	..	..	..	..	..	3/-	..	..	..	..	..	..
6	February 4/0¾	..	..	..	..	..	..	3/- to 3/2	..	..	..	..	..	..
7	—	..	..	..	..	..	..	—	..	..	..	..	..	..

STEAMER FREIGHTS.—Parcels, Port Adelaide to London or Liverpool, 22s. 6d. per ton (7½d. per bush.); full cargoes, Australia to United Kingdom—Continent, 22s. to 22s. 6d. per ton (7d. to 7½d. per bush.); Port Adelaide to Melbourne, 8s. a ton (2½d. per bush.); Port Adelaide to Sydney, 10s. 6d. per ton (3½d. per bush.).

SAILER FREIGHTS.—During May the market was stagnant, only one fixture being effected at 20s. 6d. per ton (6½d. per bush.) from South Australia to United Kingdom—Continent. The freight market, however, has since strengthened considerably, and current rates are:—To United Kingdom—Continent, 22s. 6d. to 23s. per ton (7½d. to 7¾d. per bush.); to South Africa, 19s. to 20s. per ton (6½d. to 6¾d. per bush.).

RAINFALL TABLE.

The following table shows the rainfall for May, 1910, at the undermentioned stations, also the average total rainfall for the first five months in the year, and the total for the five months of 1910 and 1909 respectively :—

Station.	For May, 1910.	Avg'e. to end May.	To end May, 1910.	To end May, 1909.	Station.	For May, 1910.	Avg'e. to end May.	To end May, 1910.	To end May, 1909.
Adelaide	4.41	7.12	8.65	8.79	Hamley Bridge	2.39	5.55	7.61	5.63
Hawker	2.49	3.94	6.45	3.62	Kapunda....	2.72	6.55	8.28	8.89
Cradock	1.88	3.70	5.84	3.19	Freeling	2.90	5.66	8.72	6.53
Wilson.....	2.57	3.90	7.39	3.57	Stockwell	3.28	6.10	7.85	6.66
Gordon	—	6.29	2.78	3.89	Nuriootpa....	3.46	6.42	8.40	7.17
Quorn	3.29	4.44	6.05	4.63	Angaston	4.10	6.37	9.53	9.51
Port Augusta....	3.47	3.77	6.05	4.32	Tanunda....	4.47	6.89	8.61	10.35
Port Germein ..	3.84	4.77	7.68	5.19	Lyndoch	4.91	6.44	8.87	9.92
Port Pirie ...	4.14	4.79	9.40	4.03	Mallala	3.90	5.67	8.09	5.82
Crystal Brook ..	3.30	5.04	7.71	5.30	Roseworthy ..	3.33	5.53	9.39	7.73
Pt. Broughton ..	4.29	4.81	7.53	5.22	Gawler....	4.15	6.44	8.62	8.79
Bute	4.27	4.90	7.67	5.07	Smithfield ..	3.68	5.20	9.02	7.24
Hammond ..	2.40	3.84	6.51	4.36	Two Wells...	3.83	5.69	7.41	5.20
Bruce	2.78	2.81	5.75	3.23	Virginia....	3.80	5.96	8.00	6.89
Wilmington ..	3.70	5.90	9.55	6.31	Salisbury....	4.58	6.31	9.45	7.84
Melrose	4.00	7.57	13.52	10.41	Teatree Gully	6.44	8.82	11.23	14.27
Booleroo Cntr ..	2.69	5.02	7.66	6.09	Magill	5.53	8.47	9.15	12.48
Wirrabara... ..	3.30	5.94	10.55	8.08	Mitcham ...	4.28	7.53	8.19	9.51
Appila	3.06	4.99	10.92	5.47	Crafers....	10.15	13.28	18.34	21.46
Laura	3.78	5.54	11.04	8.11	Clarendon...	6.44	10.63	11.13	14.61
Caltowie	3.05	5.42	8.53	5.27	Morphett Vale	5.14	7.70	8.91	10.07
Jamestown ..	3.55	5.30	6.97	4.79	Noarlunga....	5.24	6.65	8.04	8.01
Gladstone ..	3.25	5.00	7.96	4.92	Willunga....	6.74	8.28	11.30	11.61
Georgetown ..	3.96	6.06	7.53	5.18	Aldinga....	5.86	6.48	8.68	8.69
Narridy	3.88	5.67	7.15	3.89	Normanville.	4.69	6.67	8.62	8.94
Redhill	5.42	5.32	9.67	5.18	Yankalilla....	7.29	7.37	13.69	8.85
Koolunga	4.66	5.02	8.99	4.26	Eudunda....	2.63	5.28	10.77	5.15
Carrieton....	2.05	3.90	9.12	3.95	Sutherlands ..	2.51	—	7.14	1.88
Eurelia	1.85	4.30	7.44	3.65	Truro.....	3.41	5.84	7.81	7.41
Johnsbury ..	1.55	3.15	6.40	3.50	Palmer	2.28	—	7.70	5.87
Orroroo	1.67	4.77	6.63	3.55	Mt. Pleasant.	4.02	7.92	8.90	9.91
Black Rock ..	1.94	4.26	7.74	4.03	Blumberg....	4.48	8.38	9.70	12.02
Petersburg ..	2.35	4.41	6.42	4.06	Gumeracha...	5.55	9.71	11.09	16.14
Yongala	1.82	4.38	6.30	3.61	Lobethal....	5.46	9.67	11.02	16.10
Terowie	1.69	4.30	9.58	3.80	Woodside....	5.09	8.53	11.95	14.32
Yarcowie....	2.26	4.41	9.06	3.81	Hahndorf...	6.51	9.63	14.43	13.53
Hallett	2.69	4.98	7.06	4.23	Nairne....	4.46	8.51	13.38	13.27
Mount Bryan ..	2.63	4.43	7.90	3.95	Mt. Barker ..	4.73	9.27	13.22	13.83
Burra	2.61	5.62	9.12	6.09	Echunga....	6.46	9.69	16.26	15.01
Snowtown... ..	3.84	5.11	7.89	5.83	Macclesfield..	5.16	8.53	14.99	14.58
Brinkworth.. ..	3.65	4.54	8.71	3.75	Meadows....	7.50	10.44	16.70	16.58
Blyth.....	3.80	5.52	7.39	5.74	Strathalbyn.	3.23	6.16	10.58	9.87
Clare	4.51	7.72	11.19	8.24	Callington...	2.06	5.27	7.75	6.30
Mintaro Cnrtl.	3.30	6.37	10.02	7.87	Lang'rnre's B	2.38	4.96	7.00	6.22
Watervale...	3.19	8.54	10.25	10.01	Milang....	2.48	5.68	5.72	6.67
Auburn	3.18	7.82	10.57	10.24	Wallaroo....	4.08	5.05	6.10	5.42
Manoora	2.11	5.71	8.49	5.02	Kadina....	4.75	5.62	6.66	5.70
Hoyleton....	2.53	6.28	6.20	5.13	Moonta....	3.70	5.47	5.49	6.58
Balaklava ..	3.19	5.73	7.12	4.81	Green's PIns.	3.77	4.93	6.11	6.35
Pt. Wakefield ..	2.79	5.16	5.86	3.47	Maitland....	3.92	6.56	6.34	6.66
Saddleworth ..	2.04	6.75	8.43	5.45	Ardrossan ..	3.34	4.62	5.44	4.40
Marrabel ...	2.13	6.14	8.19	7.13	Port Victoria	3.55	5.25	5.42	4.39
Riverton....	2.69	6.70	10.37	7.91	Curramulka ..	4.14	5.67	7.14	6.03
Tarlee	2.52	5.89	8.81	6.31	Minlaton....	4.45	5.43	7.37	5.21
Stockport ...	2.14	5.30	7.07	4.78	Stansbury...	3.08	5.40	6.43	6.57

RAINFALL TABLE—*continued.*

Station.	For May, 1910.	Avg'e. to end May.	To end May, 1910.	To end May, 1909.	Station.	For May, 1910.	Avg'e. to end May.	To end May, 1910.	To end May, 1909.
Warooka....	4.85	5.40	7.05	4.96	Bordertown .	2.76	6.03	7.02	6.86
Yorketown .	4.09	5.46	7.51	4.99	Wolseley....	2.94	5.42	7.63	6.80
Edithburgh..	4.12	5.54	8.04	6.60	Frances.....	2.83	5.79	7.70	6.79
Fowler's Bay.	3.10	4.28	3.38	3.88	Naracoorte .	3.81	6.65	9.51	8.37
Streaky Bay.	4.72	4.79	4.84	4.19	Lucindale ...	5.21	6.65	11.37	8.83
Port Elliotson.	3.88	4.60	4.29	5.06	Penola	5.08	8.16	11.89	9.24
Port Lincoln.	3.09	6.15	4.10	5.63	Millicent	5.85	9.07	10.76	14.27
Cowell	2.03	4.47	5.59	2.09	Mt Gambier.	5.70	10.02	11.79	15.49
Queenscliffe .	6.39	5.85	11.15	5.75	Wellington ..	2.99	5.25	8.24	6.78
Port Elliot ..	3.54	6.85	7.53	7.10	Murray Bridge	3.30	4.86	10.14	7.16
Goolwa	3.62	6.02	7.26	8.74	Mannum ...	2.27	4.34	8.08	4.74
Meningie	3.45	6.14	7.15	8.48	Morgan	1.83	3.33	5.22	2.16
Kingston....	5.82	7.48	10.20	10.74	Overland Cnr.	1.85	4.17	7.91	2.65
Robe	4.73	7.47	9.41	10.45	Renmark....	1.78	3.60	6.47	3.66
Beachport...	6.37	8.16	10.30	14.45	Lameroo ...	2.26	—	6.42	5.74
Coonalpyn ..	2.49	5.35	6.70	9.13					

DAIRY AND FARM PRODUCE MARKETS.

The Manager of the Produce Export Department reports on June 2nd—

BUTTER.

The supply of cream during the month has exceeded all expectations, and as most of it has been of the better qualities, the standard has been high. Prices have risen during the month, the present rates being, superfine, 1s. 3½d. per lb.; pure creamery, 1s. 2½d. per lb.

Eggs.

Supplies during May kept up comparatively well owing to the unusually mild weather aiding the production. The Eastern and Western States' markets were kept well stocked with local supplies. Sydney reported plenty of fresh coming forward, while Melbourne reported very weak markets with over-stocked houses in fresh, chilled, and pickled. Not much business was done in Perth owing to strong local supplies. Chilled and pickled eggs were in evidence throughout the month at about 1s. f.o.b. for reliable lines. Fair outside business was done in fresh circle eggs, but, on the whole, the rates ruling in Adelaide were too high to allow of free shipment. The market opened at 1s. 4d., reaching 1s. 6d., and the month closed with business weak at 1s. 5d.

Messrs. A. W. Sandford & Co. report the following quotations on June 1st :—

FLOUR.—City brands, £9 5s.; country, £9, per ton of 2,000lbs.

BRAN.—1s. 2d. per bushel of 20lbs.

POLLARD.—1s. 1d. per bushel of 20lbs.

OATS.—Local Algerians, 2s. to 2s. 1d. per bushel of 40lbs.

BARLEY.—Cape, seed, 2s. 6d. per bushel of 50lbs.

CHAFF.—£3 10s., f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £4 12s. 6d. to £4 15s. on trucks, Adelaide or Port, per ton of 2,240lbs.

ONIONS.—Gambier, £3 15s. to £4 on trucks, Adelaide or Port, per ton of 2,240lbs.

BUTTER.—Best factory and creamery, fresh in prints, 1s. 2d. to 1s. 3½d.; second grade factories, 1s. to 1s. 1d.; choice separators, dairies, 1s. 0½d. to 1s. 1½d.; medium factory, creamery, and poor separators, 9½d. to 10½d.; store and collectors, 8½d. to 9½d.

CHEESE.—Factory makes, 6½d. to 7½d. per lb.

BACON.—Factory cured sides, 7½d. to 8½d.; middles, 9d. to 9½d.; well cut and cured farm fitches and rolls, 6½d. to 7d. per lb.

HAMS.—8½d. to 9d. per lb.

EGGS.—Loose, 1s. 5d. per dozen.

LARD.—Skins, 7d.; tins or bulk cases, 6½d. per lb.

HONEY.—Prime clear extracted, 2½d.; dark and ill-flavored, 1½d. to 2d.; beeswax, 1s. 1d. per lb.

ALMONDS.—(Scarce) soft shells, Brandis, 7d.; mixed, soft shells, 6½d.; kernels, 1s. 3d. per lb.

LIVE POULTRY.—Good table roosters worth 2s. 3d. to 2s. 9d. each; plump cockerels, 1s. 6d. to 1s. 10d.; hens and light cockerels, 1s. 3d. to 1s. 5d.; ducks, 2s. to 2s. 6d.; geese, 3s. 3d. to 4s.; pigeons, 7d. to 7½d.; turkeys, 6½d. to 8d. per lb. live weight for fair to good table sorts.

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Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT. (PETERSBURG AND NORTHWARD)

Amyton, April 22.

(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Donoghue (chair), Ward, Gum, Griffin, Baumgurtel, Crisp, Cormack, Wallace, and Thomas (Hon. Sec.).

DRY FARMING.—Mr. Griffin gave some interesting facts concerning the dry farming experiments carried out by him on behalf of the department. Eight plots were treated as follows, with the yields resulting as shown:—No. 1 plot—Disced, ploughed 6in. deep, immediately sub-packed and thoroughly surface-cultivated during the summer, yield per acre, 1908-9, 23bush. 41lbs.; yield per acre, 1909-10, 19bush. 22lbs.; average yield for two years, 21bush. 31lbs. No. 2 plot—Disced, ploughed 6in. deep, thoroughly surface-cultivated during summer, but *not* sub-packed, 1908-9, 20bush. 27lbs.; 1909-10, 14bush. 49lbs.; two years' average, 17bush. 38lbs. No. 3 plot—Disced, ploughed 6in. deep, thoroughly surface-cultivated during summer, and sub-packed before sowing, 1908-9, 20bush. 54lbs.; 1909-10, 12bush. 22lbs.; two years' average, 16bush. 38lbs. No. 4 plot—Disced, ploughed 4in. deep, otherwise same as plot 1, 1908-9, 17bush. 42lbs.; 1909-10, 14bush. 15lbs.; two years' average, 15bush. 58lbs. No. 5 plot—Disced, ploughed 4in. deep, otherwise same as plot 2, 1908-9, 14bush. 21lbs.; 1909-10, 8bush. 57lbs.; two years' average, 11bush. 39lbs. No. 6 plot—Disced, ploughed 4in. deep, otherwise same as plot 3, 1908-9, 12bush. 22lbs.; 1909-10, 12bush. 26lbs.; two years' average, 12bush. 24lbs. No. 7 plot—Ploughed 4in. in autumn and sub-packed, 1908-9, 14bush. 4lbs.; 1909-10, 15bush. 12lbs.; two years' average, 14bush. 38lbs. No. 8 plot—Ploughed 4in. in autumn, but *not* sub-packed, 1908-9, 12bush. 44lbs.; 1909-10, 16bush. 31lbs.; two years' average, 14bush. 37lbs. Plot No. 1 easily led the way, with an average yield for the two years of 21 $\frac{1}{2}$ bush. per acre; and as this and plots Nos. 2 and 3 received the same treatment in all respects but the sub-packing, the difference in yield was due to the use or non-use of that implement. Plots 4, 5, and 6 corresponded with the first three, except that the ploughing was 4in. instead of 6in. In all other respects the treatment exactly corresponded with that of plots 1, 2, and 3 respectively, and the average increase due to sub-packing immediately after ploughing was again 4bush. Plots 7 and 8, which were ploughed in the autumn previous to seeding, showed no difference in the average yield between that sub-packed and that which was not so treated. From these results it might therefore be concluded that (1) deep ploughing, when the land would permit it, was beneficial; (2) the use of the sub-packer immediately after ploughing would give satisfactory results, and more than paid for the cost of sub-packing; (3) sub-packing just prior to seeding appeared to be of no advantage. It was essential that not more than a day should elapse between ploughing and sub-packing.

WHEAT VARIETY TEST.—Mr. Griffin also gave the results of this test as follows:—Special Comeback, grown 1909-10, only 17 $\frac{1}{2}$ bush. per acre. Cumberland, grown 1909-10, only 15bush. per acre. Viking, 1908-9, 8bush., 1909-10, 16 $\frac{1}{2}$ bush.; average two years, 12 $\frac{1}{2}$ bush. Gluyas, 7 $\frac{1}{2}$ bush., 16 $\frac{1}{4}$ bush., average two years, 11 $\frac{1}{2}$ bush. Federation, 8 $\frac{1}{2}$ bush., 14 $\frac{1}{2}$ bush., average two years, 11bush. 22lbs. Pratt's Comeback, 8bush., 14 $\frac{1}{2}$ bush., average two years, 11 $\frac{1}{4}$ bush. Yandilla King, 7 $\frac{1}{2}$ bush., 12 $\frac{1}{4}$ bush., average two years, 10 $\frac{1}{2}$ bush. John Brown, 7 $\frac{1}{2}$ bush., 8 $\frac{1}{2}$ bush., average two years, 8bush. 7lbs. per acre. Of the varieties grown in both 1908-9 and 1909-10 there was not more than 2bush. difference in the average yield, with the exception of John Brown, which seemed to be unsuited to the district.

Arden Vale and Wyacca, April 25.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. M. Echert (chair), A. Eckert, Willis, Paynter, Fricker, Pearce, jun., E. and W. Klingburg, C. F. Pearce (Hon. Sec.), and several visitors.

FLAG SMUT.—Discussion took place in reference to flag smut (commonly known as black rust) in wheat. The Hookina Branch stated, in a report of January last, that both fallow and other crops were badly affected. Members of this Branch considered the principal cause was the long dry summer, both fallow and stubble being in a dry and powdery state for anything sown before the end of April last year. The Hon. Secretary had only seen one very badly affected crop in this locality last year. This was on light colored bluebush land and a stubble crop. It was put in in a very dry state two years in succession. About half the crop, which would average from 8bush. to 11bush. per acre under healthy conditions, was completely ruined by flag smut. Years ago in this district there were serious losses through this disease, but it has been stamped out by the observance of the following rules:—Do not put stubble land under crop in two successive seasons under very dry conditions. When land has to be fallowed in a dry state, do not rework to destroy weeds unless after rain. If no weeds are on the land leave it alone altogether. Only sow this class of land after rain. For new land it does not matter much under what conditions the crop is put in for the first five or six years, as no loss will result from flag smut worth speaking about.

FEED FOR DAIRY STOCK.—The Hon. Secretary introduced this subject. He was sure that the output of dairy produce and pork from this district could be trebled if attention were paid to the provision and fodder. Ensilage, for various reasons, was not likely to become popular here. Long hay, members said, was the best fodder for cows. For horses it was best to cut it with plenty of grain in it; but for milking stock it should be cut green. Wild oats and various native grasses and clovers were cut for hay for dairy stock by successful dairy farmers in this district. Emphasis was laid on the need of good thatches on hay stacks, and the Hon. Secretary thought sheaves of wheat put away till the cool weather and then threshed with a header would make valuable thatching material.

Coomooroo, April 25.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Berryman (chair), Brown, C. and E. Price, J. and L. Phillis, H. and L. Avery, White, Kirkland, W. and M. Robertson, Toholke, and Kildea (Hon. Sec).

SUMMER FALLOWING.—Mr. White read a short paper on this subject to the following effect:—It was well known to most farmers that early fallow was far superior to that which was ploughed later in the year. He had noticed that at least two farmers in this neighbourhood had adopted summer fallow, and he thought them very wise in so doing. Land treated in this manner received the full benefit of all the winter rains. It could also be harrowed while the ground was moist, treatment which not only helped to retain the moisture, but also made it nice and level, so that if sheep were turned on it to graze they could get full benefit of all the rubbish that grew. Where land was ploughed and not harrowed, the sheep were very much inclined to follow along the off-side wheel mark, and make little sheep-pads all through the paddocks. It was very evident that when they did this they did not eat it off as well as if it were harrowed after being ploughed. He was of opinion that the yields reaped locally could be very materially increased by the adoption of summer fallow.” In the discussion which followed members generally acknowledged the value of summer fallow, where farmers had time, and it was practicable to do it. Mr. Kirkland had tried it on account of wet winters with good results. It was preferable to putting in stubble land. Mr. Robinson favored it on account of the ease with which it was worked. Mr. Phillis considered that better work could be done in summer than in the winter. The soil turned over much better then than when it was wet. The depth of ploughing of course depended upon the nature of the soil. It was thought by some of those present that it was inadvisable to plough very deeply in this district, and that the plants obtained a better holding ground if the subsoil was not disturbed.

CO-OPERATION.—General discussion on co-operation took place. Mr. Robertson believed in co-operation on a small scale, but thought that big concerns cost a lot of money to manage. He thought farmers could form a syndicate to purchase potatoes, ploughshares, and other bulk goods, to great advantage. However, he would not like to injure any storekeeper who charged reasonable prices. The Hon. Secretary thought that in many centres of population depots could be formed in which the shareholders had equal interests.

Messrs. Brown and Berryman agreed, the latter adding that some classes of goods could be purchased at greatly reduced cost if large quantities were taken. Farmers had to deal with too many middlemen, and the worst feature was that they were sometimes defrauded by short weight, as in the case of binder twine.

Hookina, April 23.

PRESENT.—Messrs. Kelly (chair), Woods, Murphy, Stone, Henschke, Sheridan, Carn, Gloede, Madigan (Hon. Sec.), and four visitors.

FARM DAIRYING.—A paper on this subject was read by the Hon. Secretary. For this district he considered the milking Shorthorn to be the best animal to keep. They were as good milkers as the world could produce. They had large frames, were robust, and were good doers. They also produced good bullocks for draught purposes and the best of beef. He was not an admirer of the Alderney and Jersey breeds. Before these were introduced into this State a nice class of large-framed cow was to be found on most farms. They were good milkers, and had they been bred to good Shorthorn bulls, would have made the foundation of an excellent dual purpose cow. On many farms to-day were to be seen a lot of mongrels. The Jerseys and Alderneys were no better than other breeds for quantity of milk, but as they consumed rather less food than the larger class of animal, were rather more profitable for town folk to keep. They were practically useless for beef, and were bad doers in cold weather, and therefore were of little use in this district. The Shorthorn, if properly selected, was the ideal cow for the North, both in the good and the bad seasons. If a farmer had not a good herd of cows he should procure the best bull that he could afford and mate him to the best of his cows. Then select the best heifers and mate with a bull of the same strain as before, if it had proved to be a good one. In this way it would only be a few years before a really good herd of cows would be obtained. He thought it was a mistake when breaking in young cows to haul them up to a bail at first. They should be taken quietly, and before long could be milked anywhere at any time. If milking 10 or more cows, a 40gall. per hour separator was necessary, and to get one of lower capacity than this was to waste time. Great service to the State had been done by the Agricultural Department in experimenting with new wheats, fertilisers, &c., and there was now an opportunity to help the northern dairy farmers, who were the backbone of the dairying industry of the State. They needed to be taught how to make ensilage, conserve water, utilise underground water, grow lucerne, select cows, and suitable varieties of early maturing fodder crops. In the discussion which followed members generally agreed with the views expressed in the paper. They were of opinion that when the teats and udder were wiped carefully with a cloth, wet milking was preferable to dry milking, and that it was also more natural.

MANURE FOR RED SANDY LOAM.—Members wished to know which manure would be the best to use on a red sandy loam with a limited rainfall.

Quorn, May 21.

(Average annual rainfall, 13½in.)

PRESENT.—Messrs. Thompson (chair), Rowe, Noll, Finley, Shulze, McColl, and Patten (Hon. Sec.).

HARVESTING MACHINES.—Mr. Rowe initiated a discussion on this subject. In his opinion the complete harvester was the best machine to use. It was quickest in the end and the most economical. Mr. McColl considered that harvesters were not suitable for rough land, but did excellent work on level country. For large farms he thought the ordinary strippers and motor-power winnowers the best means of dealing with the crop. Mr. Noll had worked a harvester for the past two seasons only, but considered there was not as much waste with that implement as with the ordinary stripper.

Wepowie, May 3.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Halliday (chair), Roberts, Rielly, Crocker, Gate, Pearce, J. and T. F. Orrock (Hon. Sec.), and one visitor.

DOES IT PAY TO GROW WHEAT WITH HIRED LABOR.—Mr. Roberts read a short paper on this subject. In his opinion it would not pay to keep a man all the year round at the

present rate of wages. The amount required would be 25s. per week for 42 weeks, and £2 per week for ten weeks. Allowing 10s. per week to cover board this totalled up to £98 10s. per annum. Mr. Gale thought that in good seasons it would pay to keep a man. Mr. Rielly thought it would be profitable for a farmer who was without other help to employ a man, as this would enable him to get the seeding, &c., done in better time. Mr. Crocker had found it better to let land on the share system than to employ labor. Messrs. Halliday and Pearce were of opinion that provided the farmer owned the land, the extra profit would more than pay the cost of the employee. On a vote being taken five members declared their belief that it would pay better to employ labor for land which the farmer could not work himself, and two that it would pay better to let such land on the share system.

Wirrabara, April 23.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. P. Lawson (chair), Pitman, Blessing, Marner, Hollett, Hosking, W., W. H., and E. J. Stevens, A. and H. E. Woodlands, H. Lawson (Hon. Sec.), and two visitors.

PLOUGHING.—Mr. A. Woodlands read a paper on this subject. In his opinion the frame of a plough should be rather high, so as not to catch a lot of rubbish. A little extra height could be secured without sacrificing much strength. The mouldboard standards should also be high, but he would not have long coulters or other unnecessary ironwork sticking up where it would catch in the trees when doing orchard work. The best plough was one which cut a fairly wide furrow, say 9in. or 10in., as no plough could properly turn a narrow furrow of any depth. It was important that the furrow should be properly turned to bury weeds and rubbish, which all went to make humus in the soil. It was also important that a plough should have sufficient dip in the feet so that the share pointed well down into the soil; this would enable the hardest of soils to be successfully rooted up. Mouldboards should be wide enough at the back to make the furrow large enough to contain the soil. They should also be kept greased when not in use, as a shiny board would turn the soil much better than a rusty one, and the pulling would be easier. Coulters should always be used, as otherwise the soil was thrown on both sides of the mouldboard instead of being square and even. The coulter should be set wide enough to cut a clean furrow, and should slant well, so as not to pick up weeds. It was better to have the wheels of the plough rather large, as low wheels running in the furrow would get more earth round the axle, and the wear would be increased accordingly. Large wheels also ran more easily. It lengthened the life of the wheels to fit them with a dust cap.

Wirrabara, May 21.

(Average annual rainfall, 30in.)

PRESENT.—Messrs. P. Lawson (chair), W., E. J., and W. H. Stevens, A. and H. E. Woodlands, Pitman, Blessing, Hoskins, Curnow, Marner, E. and C. Hollett, Bowman, Kendrick, Borgas, and H. Lawson (Hon. Sec.).

HORSES FOR FARM WORK.—Mr. Stevens read a paper on "Farm Horses for this District." He thought an improvement could be effected in the class of horse kept on the farms in these parts. The Clydesdale he considered too heavy for local requirements. They were somewhat slow in action, and in winter their legs became covered with mud, and were likely to become sore as a consequence. He thought this class of animal was more suited to the needs of a teamster who had very heavy loads to move. The medium draught horse was more the stamp required on farms in this locality. The railway was within reasonable distance, and when wheat-carting had to be done it was a comparatively easy matter to put on enough of the lighter animals to get that work through. Meanwhile the lighter animals were quicker, could be put into a dray if needed, and were in every way suitable for farm work. He thought every farmer should breed at least some of his own horses. If he depended entirely upon the saleyard he would find it an expensive business. It did not pay to send mares long distances for breeding purposes unless there were other animals to take their places in the team. Mares could with advantage be worked up to within a short time of foaling, excepting on boggy land, or at very heavy work. Gentle work helped to keep the mare in good health and prevented her from becoming fat and lazy. When weaning foals they should have a yard and stall at the back of the stable, where the mares could not see them. They required at this time

some bran and chaff, and great care should be taken to see that they did not get a setback in condition. Ground lost at this period was difficult to regain. He would break in a draught colt at two years and eight months. There was a lot of light work at seeding time to keep them quiet and make them develop. They must on no account be given heavy work at this age. Light horses were all the better if driven when a little over two years old, after the hottest part of the summer was over and before the roads became wet and heavy. They must not be driven too far, however, unless for the purpose of breaking a bad temper. He believed in putting a young horse into double harness, passing a rope round his neck, through a strap from the bit ring, to the other horse's collar. This would prevent him from breaking reins or bridle if he was properly handled. Mr. Lawson said that for breeding a horse that would travel, it was best to use a draught sire and a light mare. Mr. Kendrick thought the Suffolk Punch the best breed for farm work, with which most members agreed.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, April 25.

PRESENT.—Messrs. F. Bartrum (chair), A. Bartrum, Burton, Thyer, Woolford, Curtan, Petrie, Ryan, Murphy (Hon. Sec.), and one visitor.

VEGETABLES FOR HOME SUPPLY.—Mr. Thyer read a paper to the following effect:—“A garden rightly managed was a source of pleasure and profit. He thought it safe to say that not more than 50 per cent. of homesteads were equipped with a vegetable garden. The site chosen for such a garden should slope slightly, facing the morning sun. The best soil was of a rich, loamy nature, through which the rain could easily filter. The application of lime to the soil would often improve it. Watering should be carried out regularly and thoroughly, and in hot weather care should be taken not to leave too long between the irrigations. The soil should be worked down fine, and needed thorough working. In regard to what to grow he recommended White Stone and early Snowball turnips. These could be sown from February to September. Peas (Yorkshire Hero and Little Gem varieties), carrots, parsnips, celery, rhubarb, drumhead lettuce, radish, drumhead cabbage, cauliflowers, onions, and potatoes. To make a success of a kitchen garden of this kind it was necessary to put in all one's spare time, but the saving effected made it worth while. Members were inclined to favor the establishment of vegetable gardens, and some said it was best to save seed, as that which was supplied by merchants was not always reliable. One gentleman present had found it necessary to sow the same plot three times.”

Brinkworth, May 24.

(Average annual rainfall, 14½ in.)

PRESENT.—Messrs. Davis (chair), Brinkworth, Stott, and Hill (Hon. Sec.).

VETERINARY EXAMINATION OF STALLIONS.—Mr. Davis initiated a discussion on this subject. He thought something should be done to prevent unsound stallions from being imported into this State. These animals, though sold at fabulous prices, were utterly useless to farmers for breeding purposes. From a number of mares served by one of these animals the average result was one foal to four mares. Under such conditions horse-breeding was very costly indeed. The ordinary farmer was not qualified to detect unsoundness of this kind. A resolution was then passed that “All stallions plied for hire should be licensed, and owners compelled to produce a Government certificate of soundness, for the protection of breeders.” This Branch is of opinion that veterinary examination for show purposes does not protect the producers, as half the stallions travelling for hire do not compete at shows.

Georgetown, April 23.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Hill (chair), Geo. Hill, P. and J. Higgins, W. and A. Thomson, Inglis, Bond, McAuley, McDonald, Page, Freeman, and Eyre (Hon. Sec.).

MARKETING WHEAT.—A paper on this subject was read by Mr. McDonald to the following effect:—Farmers have to take into account the production of other countries which come into the world's markets at different periods of the year, when considering this subject. These affect the prices paid for wheat directly and indirectly. There is such uncertainty in predicting the supply and demand that the market cannot be regulated as far as prices are concerned. This creates the problem as to what is the best time to sell, and also provides opportunities for speculators to work the markets with various reports which are not always genuine, and enables the bulls and bears to take a hand in making or breaking the prices for the farmers. When reading how the markets are operated by these people, we have the satisfaction of knowing that they “fall in” sometimes. When prices are forced up above true value some farmers are fortunate enough to sell their parcels of wheat before a reaction takes place. In choosing the time to sell some farmers depend on their luck, and one year may receive top prices while the next they are out of it. Some seem often to miss the high prices, while others never seem to go wrong. Some sell all that they have at the opening price for the season, whatever appearances are, and these are not far out during a course of seasons. Other farmers divide their crops into three and sell one lot at the opening prices, another during the season, and then clear up their stocks at the end of the season, thus striking an average. Others again depend entirely upon their judgment. If prices rise they feel that they had good foresight, and are quite pleased with themselves; but if, on the other hand, the market falls they have to put up with their miscalculations and make the best of it. There are also a few who will hold perhaps two or three seasons' stocks, considering that the market must eventually rise. Perhaps they succeed, but considering the great worry and risk it is doubtful whether it is worth while. In seasons such as those of late years prices have been so good that a farmer need not worry about the markets, but may take what he can get and then is making a handsome profit, especially when there is a shortage or failure in some large wheat-producing country. By some people 3s. per bushel is considered a good price for wheat, and if more than that is offering they hold for further rises and take the chance of it coming back to 3s. Another plan that I favor, if a man can afford to speculate with one or two seasons' wheat, is to take the average price extending over a number of years, and if the season's price is not up to the average to carry the wheat over, either the whole or part. If the following season is not any more profitable to realise, carry over again one or the two seasons' wheat. If a farmer keeps on this system he must eventually strike some of those big prices that occur periodically and then quit the lot—say, perhaps, two or three seasons' wheat—at prices that obtained this season, and make a fresh start. There are always low and high prices, and why should not a farmer stick to his surplus until the opportunity arrives, and let someone else sell at the poor prices. We have had several good seasons in the Commonwealth with a surplus, and are certainly getting nearer to a drought, and when this comes about big money should be offering. Australia is in a very fortunate position in the world's wheat market, as it is computed that about 70 per cent. of the world's crop is harvested during July and August, and by the time our crop is ready we are in a good position to judge values. If anything like a shortage transpires we soon know it. We are unable to glut the markets, and our small surplus is eagerly sought after. It may be very informative to keep a chart to show the annual individual crops of the different countries and the prices that occur, and follow out how the seasons effect the yields and prices; and probably some methodical investigations on these lines may produce very satisfactory results to the person following it up. I think it is just possible for clever people to anticipate to a great extent future values by studying this subject systematically.

Mount Bryan East, April 23.

(Average annual rainfall, 15½in.)

PRESENT.—Messrs. J. Thomas (chair), Teddy, Doyle, Trallagan, Williams, Gore, Dare, R. Thompson (Hon. Sec.), and one visitor.

WHEAT-GROWING.—Discussion on this subject was introduced by Mr. Teddy. Members were of opinion that for this district 60lbs. to 70lbs. of super. per acre was the right quantity to apply. Some of the land would stand more than this, even up to 1½cwt., but on other

classes of soil applications as heavy as this caused the crop to blight off. Mr. Williams spoke of the advantages of sub-packing. He considered that if practised in this district the results would more than justify the extra labor and expense involved. The general opinion seemed to be that a farm of 500 acres could be worked with a team of six horses.

Narridy, May 21.

(Average annual rainfall, 16½ in.)

PRESENT.—Messrs. Haren (chair), Lang, Nicholson, Freebairn, Black, Lehmann, Smart, and Kelly (Hon. Sec.).

MARKETING WHEAT.—A paper on this subject was read from page 895 of the May issue of the *Journal*. Members in discussing the matter were surprised that farmers had put up so long with the prevailing method of marketing wheat. The Hon. Secretary thought farmers should weigh their wheat and brand the bags before taking them to the agent. Others thought it would entail too much work, but it was pointed out that it might be worth it in hard cash. Some of those present had weighed super. this year and found bags up to 10lbs. and 12lbs. short. One member had seen an agent weigh some super. before delivery and it turned the scale at 5lbs. and 6lbs. per bag over the specified weight, but on arriving at home he put it on his own scales and found it to be just that much short of the supposed contents. Members wished to know whether super. lost weight when lying in a shed for three or four months. [Yes, an average super. might easily lose 4lbs. to 5lbs. per bag in weight during the hot weather.—ED.]

Port Pirie, May 7.

(Average annual rainfall, 12½ in.)

PRESENT.—Messrs. Johns (chair), Smith, Greig, Welch, Hawkins, Birks, McEwin, Teague, Bell, Hector, and Wright (Hon. Sec.).

FORAGE POISONING.—Mr. Hawkins reported that the remainder of the stack of hay from which horses had been previously fed and afterwards died, had now been fed to other horses and they were doing well on it. It looked, therefore, as though the death of the first animals could not be attributed to forage poisoning.

TRIP TO EUROPE.—In response to a request by members, Mr. Hector read an interesting paper on his recent trip to England and other European countries.

Redhill, April 26.

(Average annual rainfall, 16½ in.)

PRESENT.—Messrs. Lithgow (chair), Pilkington, Robertson, Lyons, Steele, Cox, Wheaten, Coffey, and Dunsford (Hon. Sec.).

DRY-FARMING EXPERIMENTS.—Reports were given of experiments made with the Campbell system of dry-farming on 10 acres of land in this locality. In no case had the yields from the special plots been greater than that reaped from crops on ordinary fallow, and members were of opinion that in this district the returns being won from the soil were too good to be improved upon at present. The extra cost and labor of the dry-farming methods were not warranted here. [It would be interesting to know just how the land was cultivated in these experiments. Absence of such details detracts from what was probably a very interesting experiment.]

Whyte-Yarcowie, May 21.

(Average annual rainfall, 13½ in.)

PRESENT.—Messrs. Pearce (chair), Ward, Hunt, G. F. and E. M. Jenkins, Mitchell, G. R. and G. D. Mudge, McCann, McLeod, M. and J. Walsh, Lock (Hon. Sec.), and one visitor.

MOTOR TRACTION ON THE FARM.—The following paper on this subject was read by Mr. Hunt:—It is over 30 years since the traction engine became a success, and for a number of years was used for hauling heavy farm machinery from one job to another, and for hauling on the roads. Of late years the tractor has been greatly improved in

construction and efficiency, and has taken the place of both men and animals. They are now extensively employed in America, not only for breaking the land, but also for discing, seeding, cutting grain, &c. The first traction engines used for ploughing were the ordinary steam threshing engine, built primarily for belt service, and their use involved numerous expensive breakages and many discouragements. The tractor of the present day is made more substantially, and steel, or semi-steel gearing has been substituted for cast iron. The service required of it is so severe that no engine can be successfully used for this purpose unless especially designed for it. If the traction engine is to attain an extended use on the farm, it must be so constructed that it may not only be used for ploughing, but for cultivating, seeding, harvesting, and haulage on the roads, and not a machine to be used only during certain seasons. It is gratifying to know that manufacturers have already turned their attention to this class of tractor, with varying degrees of success. Successful traction work depends upon three factors—first, the selection of the outfit; second, the management of the outfit; and third, its cost. The points which must be determined in making a selection are, size, weight, adaptability, convenience, economy, durability, and cost. The size of the tractor is largely dependent upon the size of the fields and the condition of the soil. In general, the size may be in direct proportion to the size of the fields—the largest fields offering the best condition for the largest outfit, and the smaller field limiting the size. The condition of the soil may be an important factor. If the fields be rough, cut out with streams or ponds, or if the ground is level but soft, the smaller and lighter outfit may be desirable. Weight is necessary in order that the engine shall have the proper adhesion to the ground that will enable it to pull its load. On the other hand, more weight than is needed means poor economy. Often over 50 per cent. of the power of the engine is required to propel the tractor itself over the ground. Although a certain amount of weight is necessary, the tractor should be as light as possible. The adaptability of an outfit may be covered largely by the size and weight; but there are a few other features, independent of these, which will determine the merits of a tractor for certain conditions. One should be selected which will burn the fuel at hand. Some of the most economical engines in the market will not burn a low-grade fuel successfully. If a good grade of fuel is not at hand this type of engine should not be considered. For soft ground, the engine with high driving wheels and wide tires are the most desirable; or, if the ground is very soft, the caterpillar-tread tractor will be the best suited for the purpose. The convenience of an outfit will determine the cost of operation to a large extent. At the present time labor is an expensive item, and if labor can be reduced to a minimum the cost of working per acre will be greatly reduced. The tractor, to succeed on the smaller farms, must be a single-man outfit. It is the matter of convenience and reduction of labor that has given to the oil tractor its present field. There is no doubt that some engines are far more economical in fuel than others. There is such a wide range in the consumption of fuel that one engine may be worked at a profit while another, under the same conditions, will result in a loss. In practical tests it has been shown that the cost of the fuel consumed in ploughing an acre of ground varied as much as 2s.—a splendid profit in itself. Durability depends almost entirely on the amount and quality of the material used in construction. Experience has not yet indicated how long an engine will last. Possibly a well-proportioned ploughing engine would last 10 years. I will point out some of the advantages and disadvantages of steam traction, oil traction, and horse-power. Although the steam engine has achieved success, it is hampered by many inherent difficulties. In the first place, it requires a large force of men and horses to keep it in operation and to supply it with fuel and water. It is not uncommon to hear of steam ploughing outfits at work where three four-horse teams are required to keep them supplied with fuel and water. Localities seem to be unknown where two teams are not required for this purpose. The engines stand idle at least 20 per cent. of the time taking in coal and water. The steam ploughing engine is also hampered by its excessive weight; such engines, whose working weights are 36,000lbs. to 40,000lbs., being not uncommon. There are large areas of territory where such weight cannot be transported over the fields without driving wheels of excessive width, which makes it difficult for the engines to turn and manoeuvre. They are too risky to use in the harvest fields in this State on account of the danger of fire. The power plant is very flexible, and gives off power very steadily. The oil tractor, compared with the steam engines of the same standard, is much more substantially constructed, but they weigh much less. They use *c* rap kerosine and petrol for fuel, and the supply tank generally holds enough fuel for a whole day's run. They are safe to use in the harvest field, being free from the danger of fire, and also from danger of an explosion, unless a light happens to get in contact with the petrol. The oil tractor can go on the land earlier than the steam engine after a rain, but they cannot go on as

early as horses can. The petrol tractor can start work as soon as the engine is started : whereas a steam engine has to wait a considerable time to get up steam. Only one man is necessary to operate an oil tractor, and the engine can be run a whole day without stopping, providing it has an efficient radiator. The horse has a few rather serious disadvantages. In the first place he cannot work very long without getting tired, and in the second place he must be fed, whether he is idle or at work; whereas the tractor is tireless and can work day and night. One great advantage horses have over the tractor is that they can be worked in teams of any number to suit the work to be done. A tractor, unless it is working at nearly full load, can seldom be profitably used. Experience seems to have proved that the traction engine can do any work that the horse can do, providing that the conditions are favorable. They seem to be able to do it as cheaply. They can do better work and do it in a shorter time than horses can. It is risky to prophesy, but if, before another decade has elapsed, the horse has not been largely replaced by oil power on large farms, the writer will be much surprised. [The views of the members on this paper, and especially on what would be required of a farm motor, would be of interest.—Ed.]

LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT.)

Angaston, May 21.

(Average annual rainfall, 21½ in.)

PRESENT.—Messrs. Stephens (chair), Friend, Roberts, Waters, Sibley, Ball, Plush, Thorne, Wishart, Player, Salter, Matthews (Hon. Sec.), and three visitors.

SPRAYING FRUIT TREES.—Mr. G. L. Wishart introduced this subject for discussion. Members had found Swift's arsenate of lead to give good results. They considered Bordeaux mixture, 6lbs. bluestone, 4lbs. lime, and 40galls. water very efficacious. Even if applied during rain good results followed. Early spraying was advised for peach aphis when trees were dormant, also for curl leaf; and winter spraying for black bud in apricots. For wooly aphis good results have been obtained from the use of red oil or crude petroleum. In the opinion of those present the "Friend" spray pump was a perfect machine, and members had all proved that spraying when properly done at the right seasons was most efficacious. They advocated early and late applications.

Clare, April 22.

(Average annual rainfall, 24 in.)

PRESENT.—Messrs. McCarthy (chair), Hughes, Jarman, Pryor, Berridge, Maynard, Lee, Pascoe, Nolan, Scales, Knappstein (Hon. Sec.), and two visitors.

MANURES FOR LOCAL SOILS.—The following paper on this subject was read by Mr. Hughes—The use of manures has without doubt been the means of increasing the productivity of our land, both as regards wheat and feed, and the improvement has been most noticeable in the poor country. I have known instances where the use of super. has more than doubled the return. Here in our own district I think we can apply manure heavily. We have a good heavy soil, but it is very cold, and in the winter vegetation makes practically no growth, and by a heavier dressing I think we may be able to promote a steady growth through the winter months. If we can in this way get a good covering over the ground before the hot weather sets in it will help to prevent the land from baking, and give the crop the full benefit of both moisture and manure. Last season I tried one ton of Mount Lyell special wheat manure, and the rest of my crop was put in with super. I used 1cwt. to the acre right through. On the heavy black and red land the super. gave the best results. On the limestone rises neither super. nor wheat manure gave good results. The crop looked well until it started to run to ear, and then it seemed to die right back. A friend who has had

a number of years' experience in the district had the same experience, and had just as good a return on the limestone with no manure as with the super. He advised me to try guano super. I think it will pay us to manure heavily—at least 1cwt. per acre. If we can manage to put on 2cwt.s, so much the better, for it is an established fact that you can manure land heavily year after year and grow heavy crops, and if you graze it you can carry as much stock on two acres which have been well manured as you can on three that have not. A good discussion followed, in which Mr. Jarman thought superphosphate would be beneficial on the limestone ridges in the hills in any ordinary season.

CORRECTION.—In our last issue we printed a paper on Improvement of Farm Stock. This was written by Mr. H. C. Lockyer, but through an error the name given was that of Mr. J. H. Knappstein.

Freeling, April 8.

(Annual rainfall, 17 $\frac{2}{3}$ in.)

PRESENT.—Messrs. J. A. Mattiske, sen. (chair), Heinrich, Neldner, Schuster, Koch, Mattiske jun., Power, Shanahan, C. H. and E. H. Mattiske, Heinfeldt, Bailey, Noske, Nenke, Block (Hon. Sec.), and ten visitors.

TAKEALL.—Mr. Heinrich referred to a paper on takeall which had been discussed at a meeting of the Port Pirie branch (see page 701, March issue). Agriculturists had for many years sought for the cause and cure of this pest, and as a result it had been clearly shown that growing oats and wheat alternately reduced the trouble to a minimum. Farmers had sometimes departed from this practice on account of the slight difference in price of wheaten and oaten hay, but the result had been a re-appearance of takeall in the crop, perhaps in a worse degree than before. He therefore would advise farmers to crop alternately with oats and wheat. Others present were of opinion that packing the soil closely was a preventive. Takeall was not found on the headlands, but was always most prevalent on loose soil.

Freeling, May 13.

(Average annual rainfall, 17 $\frac{2}{3}$ in.)

PRESENT.—Messrs. A. Mattiske, sen. (chair), Koch, Elix, H. and A. Mattiske, Heinrich, Klenig, Neldner, Neindorf, Keane, Block (Hon. Sec.), and two visitors.

MOLASSES FOR HORSES.—Discussion as to the value of this product as part of the horses' diet took place. It was thought that while not equal in food value to bran, molasses made a very healthy addition to the horses' fare as a change. Mr. Koch had used it a good deal in the past and found it not only made the horses' coats shiny but, when fed with oats and bran, kept the animals in a healthy condition. At a time when chaff was very inferior and horses would not eat it, the addition of some molasses made it quite palatable to them.

LIME FOR THE SOIL.—As the result of a discussion members decided that while lime would doubtless improve some soils, particularly as a sweetening agent, it would be a waste of time and money to apply it to the soils of this district.

STORING WHEAT WITH MERCHANTS.—Mr. Heinrich was of opinion that it would pay farmers to store wheat with merchants rather than attempting to keep it on the farm. In addition to the difficulty experienced in keeping out the weevil and other pests, there was a distinct advantage in having the grain quickly available when it was desired to sell.

Gawler River, April 22.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Roediger (chair), Hillier, Dunn, Clements, Richter, Davis, and Winckel (Hon. Sec.), and one visitor.

SEED WHEAT.—Mr. Richter read a paper on seed wheat to the following effect. Every farmer should select and grow his own seed. This was perhaps the most important item on the farm. The best head in the field could be selected, or if the farmer were a good judge he could pick out more than one head. These could be grown four or five years, selecting the best for seed from time to time. In this way pure seed could be obtained. The rarity of pure seed had been demonstrated in the competitions recently held, in which only one variety gained the maximum points for purity of seed. Unless the seed was pure the crop could not be expected to be true to type. He had known farmers to cut best

wheat for hay and leave the inferior stuff for grain and seed. Unless some selection was carried on from year to year, wheat deteriorated in quality and value. Having got clean seed care should be exercised to avoid mixing it by any means. Some farmers depended too much on the grader, which, while it separated all the small and large grain, would not separate one variety from another. A lengthy discussion followed, chiefly on the flowering of wheat.

Mallala, May 9.

(Average annual rainfall, 16½ in.)

PRESENT.—Messrs. A. Marshman (chair), Jarmyn, Moody, Worden, G. Marshman, J. and A. V. Nairn, East, Griffiths, Loller, and Nevin (Hon. Sec.).

BUREAU WORK.—The Chairman read the following paper, being suggestions for the improvement of the branch of the Agricultural Bureau. No class of individuals playing such an important part in the world's progress are of such a divided nature as the men who are tilling the soil. While their interests and welfare are identical, there is not that spirit of unity which tends to create a strong organising force. I maintain that all practical farmers should combine and form a strong organisation through the medium of the Agricultural Bureau. We have a branch of this Bureau here, but how little interest is taken in it. Out of say 50 farmers, only about 20 deem it advisable to avail themselves of the facilities offered. Perhaps there is something lacking on the part of members who do attend. My purpose is to try to offer a few suggestions that will make the Bureau meetings more interesting. The first suggestion is that every member should make a determined effort to attend all meetings when notified by the secretary. No force has reached its high ideal without special effort. It is very discouraging to hear the secretary's report that out of 20 members on the roll there is only an attendance of about eight, and very often not a quorum. I would urge upon members that this is about the only organisation existing for their direct benefit, and they should therefore make it their business to attend. I would suggest also that we introduce a question box, where any person, whether a member of the Bureau or not, could hand in any question which has troubled him. Such questions, when brought forward in the Bureau meetings, would not only enlighten the person himself, but would lead to some good discussions, and bring to light subjects that might otherwise be overlooked. Instead of our meetings being held at one particular place every time, we should occasionally have a homestead meeting. This system is followed by some of the branches with satisfactory results. The farmers and friends could assemble together at one particular farm and have a good practical demonstration of that particular farmer's ideas, and a general conversation on various matters. That would create the spirit of unity referred to, and it would also cause an improvement in the appearance in some of the homesteads; because if a man knew that all his neighbors were expected to pay him a visit, he would naturally have a general clean-up. Some people say that in a district like this, which can produce a 30bush. average, we do not want tution, nor do we need the Bureau; but the Bureau has helped to produce that 30bush. average, therefore farmers should make themselves interested in this organisation, and instead of holding to themselves the knowledge they have gained after each year's practice, should come to the Bureau meetings and give, like patriotic men, the benefit of their experience. Some people seem to think the Agricultural Bureau is in existence for the benefit of a few modern farmers only, but this is not the case. At our meetings, once or twice a year, I think we should have a display of various products grown on each farm; because the farmer of to-day, instead of entirely depending upon wheat-growing, has introduced various other crops, which are a financial help. If a sample of each of these were brought to our meetings it would arouse enthusiasm, and competition would naturally result. Good would be done to themselves as well as aiding the Bureau. The writer also thought steps should be taken to secure visits from several experts of the Department of Agriculture. In the discussion which followed members considered that many subjects debated in past meetings, had, through lack of sufficient discussion, been left in an unsatisfactory state. It was considered that a syllabus drawn up at the beginning of the quarter, with certain subjects allotted to particular members, would prove more effective. For the successful working of the question box, much care would need to be exercised. More than impromptu answers were needed, and time for deliberation should intervene between the date of sending in questions and the answering. Several members considered that an annual exhibition of products would be of more benefit than an indiscriminate show of specimens at various meetings. It was thought that the visits to homesteads, which had been dropped for many years, might be renewed with advantage to all.

Northfield, April 19.

(Average annual rainfall, 19in.)

PRESENT.—Messrs. Williams (chair), Dall, Kelly, Rowe, Holgrave, Goldney, Nelson, Reynolds, and Mitchell.

THATCHING HAYSTACKS.—The following paper on the question of the thatching of haystacks was read by Mr. Kelly :—“ Farmers as a rule do not protect their stacks sufficiently from rain. It is no uncommon sight to see a man covering his stack three months after it has been built. After the trouble, expense of growing, cutting, and stacking, the proper thing to do is to protect it from rain at once. This year most of us know the difference in the quality of the hay in a stack that was well covered and a stack that was not covered. Of course we do not often get such rain as we had in March of this year; if we did it would make us more prompt and careful about covering our stacks. For covering a stack, in most of the farming districts straw is the cheapest material, and the best; 6in. or 9in. of straw put on by a man who knows how to thatch, will protect it from all the rain we get in 12 months. In this district, where everything is cut for hay, and straw is scarce, I think it would be the cheapest in the long run to cover stacks with iron. The first year's outlay would be the only expense, for with care the iron ought to last a man a lifetime. When put on properly everything is kept dry, and the iron is always ready at hand to put on when the stack is finished—a point greatly in its favor. For a comparison of prices I have taken one of my own stacks, 24ft. by 132ft., the top 8ft. above the eaves. I thatched it with hay, using 5 tons, and taking the value at £2 a ton, the cost of material is £10. Four tons of straw would make a better job, at say 25s. a ton—this makes the cost of material £5. To cover it with 26-gauge iron would cost £35 10s. Taking a 10 years' average, the iron is the cheapest, and there is no doubt it is the best.” Members were of opinion that straw, either loose or thatched, was the best covering to use. They admitted that not many stacks in this district were well thatched.

Salisbury, May 3.

PRESENT.—Messrs. Moss (chair), Sayers, King, John, Jas., E., and A. H. Harvey, Laurie, McNicol, Urlwin, Hartman, L. Jenkins, Tate, E. and R. Whittlesea, Heddle, Bussenschutt, Sexton, A. Jenkins (Hon. Sec.), and one visitor.

FUMIGATING CITRUS TREES FOR RED SCALE.—A paper on this subject was read by Mr. Tate. He described the method of mixing the chemicals, when the airtight tent had been properly placed over the tree, as follows:—A tree 15ft. high required about 14ozs. cyanide of potassium and 15ozs. sulphuric acid. The former should be placed temporarily in a paper bag and the latter should be added to three times its own weight (viz., 45ozs.) of water, which has been previously placed in an earthenware vessel. Having earthed over the edges of the tent, the water and sulphuric acid is placed near the trunk of the tree, and the cyanide of potassium dropped into it from the bag. A piece of hessian was placed over the vessel, and the opening in the tent promptly closed. The best results were obtained by doing this work once a year, and at night time, as the light seemed to have a bad effect on the hydro-cyanic gas liberated by mixing the two chemicals. Two men were needed. The tent cost about £6, and some small weights, scales, and a measuring glass were necessary. When removing the tent, it was advisable to keep to windward of it to avoid the fumes. The chemicals should be kept carefully locked up till used, and the hands of those dealing with them should be thoroughly washed afterwards. [These precautions are very necessary, as, while both the chemicals are poisonous, the cyanide of potassium, in addition to being one of the most deadly poisons, is not unpleasant to the taste.—ED.]. Mr. Tate exhibited specimens of lemons. One which had been fumigated had the dead scale adhering to it, but the color had changed from light red to dark red. In the discussion which followed it was generally admitted that fumigation was beneficial to the trees, and paid for the outlay involved. The good results were said to last three or four years.

LICENSING STALLIONS.—General discussion on this subject took place. Mr. Whittlesea considered that licensing or imposing a tax on stallions would not result in any improvement in the grade of the stock raised. Others thought animals were disqualified by veterinaries on account of ailments which could not be transmitted to their progeny. They thought the way to improve the stock was to educate people in regard to horse-breeding. They would then be careful to breed only from sound stallions and mares. [The trouble is that without special veterinary knowledge diseases may be present in a stallion and yet be unsuspected by the average horse owner and breeder. Therefore some protection of the latter seems necessary.—ED.].

YORKE PENINSULA DISTRICT.

(TO BUTE.)

Maitland, May 7.

(Average annual rainfall, 19½in.)

PRESENT.—Messrs. Hasting (chair), Bawden, Barry, Hill, Jarret, Lutz, O'Grady, Tossell, and Pitcher (Hon. Sec.).

AREA OF FARMS.—Mr. H. Bawden read a paper on the subject of the area of holdings in new districts. They could not help being struck with the large number of disappointed applicants for land in the newly-opened country. He was of opinion that this was due to the land being cut up into too large blocks. While the Government were repurchasing estates of a few thousand acres in area, and allotting them in blocks of 400 acres to 500 acres, they were surveying Crown lands in areas of 1,500 acres and over. In his opinion, Crown lands suitable for cultivation should be surveyed in blocks of not exceeding 640 acres. This was surely a large enough farm for the average man to make a start on. By making the areas a reasonable size a much larger number of applicants would secure land. He would give the selector the land rent free for the first two years, paying only the first instalment when the land is allotted. When they read that there were between 200 and 300 applicants for about 50 blocks, it shows the necessity for some alteration. Inferior lands should be cut up into large blocks, of say 2,000 acres to 5,000 acres, but great care should be taken to cut the better land into a greater number of farms. The paper was well discussed by members. Mr. Jarrett considered 1,200 acres to 1,500 acres not too much for a man with a family : 640 acres of this class of land was insufficient in his opinion. Mr. Hill agreed with Mr. Jarrett. In the early days the mistake was made of selling the land in too small areas, and the State had been put to unnecessary expense in surveying. Mr. Tossell said he did not blame anyone for holding a large area of land if he could obtain it, but at the same time it was a mistake from the point of view of the general welfare. A man with 2,000 acres to 3,000 acres often let a portion on halves, but he would sooner see a man working it on his own account.

Pine Forest, April 26.

(Average annual rainfall, 13in.)

PRESENT.—Messrs. Johns (chair), Adams, Carman, Goodridge, Bayne, Pearce, Nelson, Hewett, Edwards, Schultz, and Barr, jun. (Hon. Sec.).

VEGETABLES FOR FARM USE.—Mr. Schultz read a paper on the subject of vegetable-growing. He recommended sowing cabbage, cauliflower, and lettuce seeds at about the end of February in small beds so as to have plants to transplant by the middle of April. The two former should be planted out in rows with 2ft. between each, and the lettuce should have a foot between the plants. It was a good plan to sow small beds of seed every five or six weeks, and transplant them as soon as they were large enough. The land should be put in good heart with stable manure, and when planting a little superphosphate could with advantage be applied. A further dressing of super. should follow when the plants were about half grown. Until they were well established the young plants needed watering every day, but after that less frequently. They should be hoed three or four times. He planted about 30 or 40 cabbages and cauliflowers at a time, and 60 or 70 lettuce, and these more than supplied the needs of the farm. Carrots, parsnips, and beet should be sown at the end of April on land that had been well manured the previous year. Sow in rows about 10in. apart, and as soon as the rows could be properly seen Dutch hoe to kill the weeds. When the plants were about 2in. high thin them out to about 4in. or 5in. apart. Hoe several times to keep the soil clean and loose, and if a dry spell of weather was experienced water them. When grown they would keep for use right through the summer and into the following winter. Peas did not do well on land that had had heavy applications of stable manure, as they grew too rank. He generally kept a patch in a fallow paddock near the house for peas. He put phosphate along the ground with the drill about 30in. apart where the rows of peas were to go, and then drilled out with a hoe about 3in. deep, at the same time mixing the super. with the soil to avoid burning the peas. The peas were planted about 3in. apart, and hoed two or three times while growing. It was best to plant every eight or nine weeks at the commencement of the season, and more frequently later on when the plants matured so much more quickly. Turnips, radishes, &c., should

be sown every fortnight to ensure a continued fresh supply. Swedes could be sown as soon as possible after the early rains, also on fallow if possible. They should be 12in. apart, with 15in. between the rows. When they were grown, if instead of letting them go to seed they were taken up and the tops and roots cut off, and the swedes placed back in their holes and covered with three or four inches of soil, they would keep for a couple of months or more. Two or three marrow or trombone plants put out about August and watered every week or so would supply good vegetables during the summer and autumn. He would advise planting only small beds at a time, as it then only took a few minutes to hoe and water, and if well looked after it was surprising how small a plot would supply a family.

CO-OPERATIVE SHEEP-SHEARING.—Mr. Hewett reported that he had thoroughly canvassed the district as requested by members, and although the system seemed to contain many advantages the majority of wool-growers in the locality were not favorably disposed towards it. One man conducted a practical test in the matter, and found that all things considered he received about the same monetary return from the old system as from the co-operative. Mr. Adams said that not only were most wool-growers who had not tried machine-shearing loth to do so, but some of those of who had installed the plant were now reverting to the old method of hand-shearing. It was decided to let the matter rest for a year.

PICKLING SEED WHEAT.—Mr. Adams stated that he was, for the first time, pickling by the dipping method, using a 1 per cent. solution of bluestone. It looked rather thin, and he was anxious to receive the assurance of members that the solution was sufficiently strong to be effective. This assurance was given by those present.

WESTERN DISTRICT.

Colton, May 2.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Whitehead (chair), Hull, P., M., and N. Kenny, Shepherd, and McBeath (Hon. Sec.).

DIPPING v. SPRAYING SHEEP.—Mr. Hull read the following paper on this subject:—“Dipping sheep is very dirty and laborious work, and before the last of a small flock has been put through the dip the mixture might well be described as mud. Consequently, if the wool is at all long, it becomes very dirty, and remains so until it is shorn off. To avoid this it is necessary to empty the dip at intervals, and refill it at a cost of fresh powder and much labor and loss of time. This year I have bought a rotary spray pump, with about 6ft. of hose. This hose would answer much better if it were at least 12ft. long. The manner in which it is worked is as follows:—Two posts are firmly fixed in the ground, and the pump is bolted on to a cross piece. A 30gall. cask is sunk a little into the ground, and the pump is connected with it by means of about 3ft. of lin. black iron pipe. If this arrangement is situated handy to a sheep race it is a comparatively simple matter for one man and a boy to thoroughly spray 1,000 sheep per day. The whole apparatus does not cost more than £2, and I believe it will be as effective as dipping, provided of course that the sheep are not literally covered with tick. I saw very few tick in my sheep last year, but am sanguine that there will not be any next year. Spraying is much cleaner work than dipping, and if the mixture in the cask is kept stirred there is no waste of powder. I am rather sceptical about the value of some of the dips sold, and therefore add about $\frac{1}{2}$ lb. of arsenic to 30gals. of water.” In the discussion which followed, members were of opinion that the experiment made by Mr. Hull was well worthy of consideration.

Cummins, April 23.

PRESENT.—Messrs. Cooper (chair), Hill, Hall, Sabey, and Sivior (Hon. Sec.).

CULTIVATORS.—Discussion on the best cultivators for the mallee land of this district took place. The Hon. Secretary spoke very highly of the McKay twin disc cultivator. It was the best implement he had used for this class of land. Hard ground was worked

to much better advantage with this than with a plough. It would pull off fully 75 per cent. of mallee shoots and broom bush. Mr. Hall had been using a Triumph cultivator. It was a very good implement, but where many little sticks or roots were met with it was liable to become blocked up. He intended to do his fallowing with it this season.

Cummins, May 21.

PRESENT.—Messrs. Cooper (chair), Hill, Farmilo, Sabey, Rard, W. Sivior, (Hon. Sec.), and two visitors.

CARE OF MACHINERY.—The Chairman read the following paper on this subject:—“Care should be taken of machinery whilst working, and also whilst not working. When taking a machine out into the field for work, always see that it is in good working order by thoroughly overhauling it. Be most careful to see that the bearings are taking oil correctly. It is also advisable to see that nuts are tight and everything in good order before starting each morning. A few minutes spent with the spanner at this time will very often save half a day at the blacksmith's with a breakage. Whilst working, should you notice a nut loose, or some other little thing out of order, do not wait until you come to some stopping place, but stop at once and attend to the disorder. Use good oil; oil little and often; and be sure the oil is feeding properly. When you have finished the season's work, do not leave the machines standing in the field for the next season. Take them to the homestead, overhaul them, and see if any parts are wanted. Have all out of order parts replaced, and put them in a good dry shed out of the weather. Some farmers believe in cleaning all the oil off. This certainly has to be done to a certain extent to see the parts, but in country like this, where the winter is very wet, I do not think it advisable to remove all the oil, as the cleaned parts and bearings may rust. It is also advisable to paint the woodwork of machinery every two years. This helps considerably in the preservation of the wood, and the machine lasts longer. Harness should be oiled twice yearly. Always wash the dirt off before oiling, and do not oil too liberally, as otherwise the leather opens too much and takes in the weather. Neatsfoot oil is recommended, and I also find salad oil very good.” In the discussion which followed, Mr. Sabey did not believe in oiling little and often, he thought it best to oil as little as possible. Most members thought it best to build stone iron-roofed sheds, but Mr. R. Sivior preferred the old-fashioned wooden shed with a straw roof.

Merghiny, April 16.

PRESENT.—Messrs. Tallot (chair), Bubner, Shilton, Symonds (Hon. Sec.), and one visitor.

SEEDING OPERATIONS.—A discussion on seeding operations took place. The Chairman believed in thick sowing for this district, and thought the thick growth would protect the young plants from frost. Mr. Bubner said there was more protection from frost on fallow land and there was also more moisture. He found thinly sown crops to ripen best. His practice was to halve the seed and cross drill. It paid, he said, to put in less land and cross drill. The Chairman expressed his intention of trying this method of seeding. He preferred deep drilling, as the wheat then stooled out well and obtained more moisture. Mr. Bubner had found that in dry weather the bottom roots died off, but the plants afterwards put out fresh roots higher up the stem.

PICKLING SEED WHEAT.—Mr. Bubner reported that he had planted 20 grains of wheat which were pickled a year before, and of this number 18 germinated and grew. [What pickle was used?—ED.] He thought formalin the best pickle, and used a portable iron tank to dip the seed in. Bluestone injured the tank, but the formalin had no injurious effect upon it.

Merghiny, May 5th.

PRESENT.—Messrs. Tallot (chair), Bubner, J. and E. Schwartz, Shilton, Sharpe, Barnett, Symonds (Hon. Sec.), and one visitor.

WHEAT-GROWING.—A general conversation on wheat-growing took place. Mr. Bubner thought smut spores could be successfully removed from seed by immersing it in water, when the spores would float off. He also thought the spores remained in the ground, and that a fire should be passed over it to destroy them. He had seen patches badly

affected in an otherwise clean crop, where the fire had missed. Members present had had very little experience of this trouble. The Chairman had pickled Purple Straw wheat, sown it on new land, and it was affected with smut. He had sown a bearded wheat without pickling, and the crop was clean.

CATERPILLARS.—The Hon. Secretary said that three years ago he had practically the whole of his crop destroyed by caterpillars. He only reaped 3bush. off 60 acres. Mr. Bubner had the same trouble, but as his wheat was earlier, it did not fare so badly. However, the caterpillars ate off the grass.

WHEAT FOR DISTRICT.—The majority of members favored Guyas, even before Federation, on account of its earliness. Mr. Bubner said that sown in firm ground this variety was as good as any other to reap. The Chairman had frequently seen it go down, but generally in one direction. He reaped it in the way it lay. For hay Purple Straw, Marshall's Favorite, Neuman's Early, and Steinwedel, were recommended, and for chaff, Silver King.

PLoughing.—The Chairman considered that shallow ploughing was best for this district.

Miltalie, April 27.

(Average annual rainfall, 14½in.)

PRESENT.—Messrs. Jacobs (chair), Fairbank, Story, Grund, Laffin, Smith, and Hier (Hon. Sec.).

SOLDERING.—In view of the many occasions on which a farmer needs to do a little soldering, Mr. Grund read a paper dealing with that question. “The copper surface of the soldering-iron should be smooth and quite free from cracks or flaws, and should be tinned by rubbing it when hot upon a piece of salammoniac and then running a little solder on to the salammoniac and rubbing each surface of the iron in it. If a solution of salammoniac and water is prepared and the iron is dipped into this just before use it will be in perfect order. It is always necessary to clean with spirits of salt anything to be soldered, after which the spirits can be wiped off and the article is ready for the solder. For kitchen utensils it is necessary to use spirits of salt in which some zinc has been dissolved.” [For galvanized iron or zinc use the spirits of salt as purchased, but for plain iron, tin, brass, copper, and other metals use spirits which have been “killed,” as described above. It is absolutely necessary when repairing utensils to remove all grease, &c., and to clean the surface till the bright metal is reached.—ED.]

Miltalie, May 21.

(Average annual rainfall, 14½in.)

PRESENT.—Messrs. F. Jacobs (chair), Smith, M. and R. Searle, Story, J. S. Jacobs, J. A. and M. J. Laffin, Ramsey, Hier (Hon. Sec.), and 10 visitors.

ADVANTAGES OF JOINING THE AGRICULTURAL BUREAU.—The Hon. Secretary read a paper under this title to the following effect:—“Perhaps the principal advantage of the Branches of the Bureau was that in the meetings farmers were brought into the closest touch with each other, and a mutually helpful exchange of ideas was the natural outcome. The printing of the reports in the *Journal* of the Department was of great value. By a careful study of its pages many members and other farmers had been able to find out the most suitable varieties of wheat and other products for their own particular district. Progressive farmers had to experiment to an extent, and the Bureau formed an excellent means of making known to each other the results obtained by certain practices in cultivation, &c. Matters discussed in the Bureau meetings covered a very wide range of subjects, so that practically nothing pertaining to successful farming was left out. Questions were asked at the meetings, and frequently satisfactorily answered. If the advice or opinion of the Government experts was required on any of these matters it could be obtained through the Branch, and was usually printed in the *Journal*. By this means many other farmers who were perhaps uncertain on the same question had the opportunity of reading the replies given. Excellent work had been done by some Branches in the holding of field trials of implements. At these trials farmers had the opportunity of seeing all kinds of makes of implements at work, and could better judge as to their suitability to their own requirements and the effectiveness of the work done. It also had a bearing on the quality of the machines turned out by the manufacturers, as there was frequently somewhat keen competition at these trials. Many a young farmer gained a great deal of valuable information at the meetings of the Branches, and it was frequently there

that they first learned to do a little public speaking. The writer made sympathetic reference to the late Mr. Albert Molineux, to whom the Bureau owed so much. Finally, he considered that the amount of benefit derived by individual members of the Branches from their connection with the Bureau depended entirely upon the amount of interest that they took in the doings and welfare of their Branch." Members agreed that there were sufficient advantages connected with the Bureau to warrant a larger number of members.

Mitchell, April 23

PRESENT.—Messrs. Ward (chair), Ness, Sampson, O., P., and J. Green, Molly, McCormack, Head, Gregory, Dorward, (Hon. Sec.), and five visitors.

HAY-GROWING.—Mr. Ness read a paper on the question of hay production. On timber land similar to his own he would plough 4in. deep, harrow the soil down level and drill in one bushel of Red Straw wheat and 50lb. super per acre. In August he would roll the soil as level as possible, so as to be able to cut the full length of the straw at harvest-time. Scrub land he would fallow in July when the land was wet enough to plough out most of the mallee and broom-bush stumps. In April of the following year he would clear off the stumps and shoots, harrow hown level and drill in a bushel of seed to the acre of some wheat which produced a lot of flag; drilling in with the seed $\frac{1}{2}$ cwt. of super. per acre. In discussing the question Mr. Ward said his favorite wheat for hay was Leak's Rust-proof. Mr. Brice thought it inadvisable to cultivate fallow more than 2in. deep. He would harrow before drilling—cross drill, and sow 1bush. of seed and $\frac{1}{2}$ cwt. manure per acre, the latter containing a large percentage of nitrogen. He would also apply $\frac{1}{2}$ cwt. of air-slaked lime to the acre. He considered Leak's and Smart's Early wheats hard to beat for hay. Mr. Dorward mixed 1bush. of white oats with 3bush. wheat for hay. He had found Red Straw to do well in this district. Mr. Sampson favored oaten hay. He recommended Abundance and Storm King varieties.

Mitchell, May 21.

PRESENT.—Messrs. D. Green (chair), Ward, Howell, Head, O., P., and J. Green, Molloy, Millar, Ness, Gregory, McCormack, Sampson, Dorward (Hon. Sec.), and four visitors.

PICKLING SEED WHEAT.—Mr. A. C. Brice's paper on this subject was read by the Hon. Secretary. Of the many preparations which were used to pickle wheat for the prevention of bunt (mislabeled smut), he preferred to use bluestone, for several reasons. It was cheap and handy, effective, and if small mistakes occurred in mixing there was less likelihood of damage to the wheat resulting than was the case with some pickles. He referred to the double pickling trough, and considered it an effective means of thoroughly wetting each grain. The strength of the solution could be kept up by leaving a small bag of bluestone suspended in the solution. A 1 per cent. solution (1lb. to 10galls.) was, in his opinion, the best strength to use. The method of pickling on the floor was also described. It was advisable to leave the seed wheat for two days before sowing, to dry thoroughly. A good discussion followed. Members agreed that it was best to let the seed get quite dry before sowing, although some had gone on seeding almost immediately after pickling. Mr. Ward thought that the smut trouble was increased by reaping the seed before it was quite ripe, and this applied especially to Steinwedel, which variety, on account of its tendency to shake out, was usually stripped somewhat early. Wheat intended for seed should be allowed to stand and bleach as long as possible. He had never seen smut in a self-sown crop, including the above-mentioned variety. Mr. Millar spoke very favorably of the good work which could be done with a McCabe's pickler. He thought it a most up-to-date contrivance. He agreed that a 1 per cent. solution was best.

CONFERENCE OF WEST COAST BRANCHES.—Members decided to support the movement to arrange a conference at Cummins, and the Hon. Secretary was requested to communicate with other Branches on the matter.

Penong, May 14.

(Average annual rainfall, 12 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Shipard (chair), Edwards, Lovell, Farrelly, Wold, Bennier, and Oats (Hon. Sec.).

CO-OPERATION.—The Hon. Secretary read the following paper on this subject:—"Co-operation has often been discussed in Bureau meetings, but no finality seems to be arrived at. Nevertheless, I think it should be constantly in our minds, and it could

be tried, even in a small way, by members of the Bureau if someone capable would undertake the work. It is well known that buying in bulk is far cheaper in the purchase of machinery, manures, twine, or oil, &c. In selling the same thing applies, as often 1d. or more per bushel can be obtained for a large parcel. If six farmers wanted a reaper each, and each favored a different make, they could be obtained in one order. The Farmers' Co-operative Union would be a very good medium to supply all the needs of the farmer, and it would help to forward the co-operative principle. If more farmers would join this Union its operations would soon extend, and a lot of money that now goes to the middlemen would be retained by the farmers, or would be returned as dividends." Members in discussing paper agreed that co-operation would be beneficial if it could be carried out, but did not think it practicable on the whole. They thought, however, that a few lines could be purchased on the co-operative principle.

BUREAU WORK.—The Hon. Secretary read a paper on the question of how to get more interest and life in the work of this Branch, as follows:—"It is a matter for regret that so little interest is manifested in our Bureau meetings. Compared with the number of farmers in the neighborhood only a few are members of the Bureau. This prevents the Branch from being as useful as it otherwise would be. Then again, the average attendance of members shows a lack of interest, and it seems as though something needs to be done to improve matters. Unless more interest is displayed the Branch will cease to exist, and if allowed to fall through it would be a difficult matter to start again. I think each member should do its best to make the meetings as interesting as possible. Those who are usually silent could find something in the *Journal* that is interesting to bring under the notice of the meetings. The *Journal* itself is a valuable as well as the cheapest publication on agriculture that can be obtained in the State. Every farmer, whether a member of the Bureau or not, should obtain it. If the copies are kept, as they should be, quite a lot of information is stored away which should be of special value to those who are starting farming. Here they have the opinions of mature farmers on a large number of subjects. Of course everyone has to experiment for himself, as what is suitable in one district may not suit another, even if only a few miles are between. The country varies considerably, as, for instance, is the case in our own district. The plains land, boxbush, and mallee each need to be worked differently. Probably each may require different manures, or a mixture of different manures may be beneficial. To find this out each should try for himself, also the quantity per acre, as there does not seem to be any set rule to go by. I think each man should try small plots with that object in view. It means a good deal of extra labor cultivating each plot separately, but that seems the only way to find out, and even then the different seasons have to be taken into consideration. As a rule I only manure the land I expect to put in the following year. In some cases a marked difference shows in favor of the manured portion, and in other paddocks there is little difference in the yield. Last season I put in 60 acres in one paddock that had been left out for two years, without manure, and it gave a return of 15bush., while the other portion of the paddock, sown later, with the same seed and with about 30lbs. super., only gave a return of 13bush. Towards the end of the seeding last year I put on about 150lbs. super. for one round of the drill, and it seemed to promise double the crop that would be reaped where 30lbs. was used, but as I did not reap it separately I cannot state the difference. I would like to know if others in the district have tried the different quantities of manure, and, if so, the result. I am trying a small quantity of guano, and also a compound fertiliser, and will watch the result with interest." Members had not tried different quantities of manure sufficiently to form an opinion.

Petina, May 21.

(Average annual rainfall, 12 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Penna (chair), Kenny, Wharf, Howard, J. J., H. A., and C. P. R. Trezona, Doley, Souter (Hon. Sec.), and two visitors.

PICKLING SEED WHEAT.—A general discussion on this subject took place. Mr. Trezona had experimented with Dollman's Farmers' Friend, bluestone, and without pickling last year. The wheat that was pickled was all free from smut. When he first took up this land the seed was very smutty, and he pickled with bluestone. The crop was free from smut, and the pickling has been repeated each year with the same result. He had tried fungusine this year, but was not satisfied with it. Unless the wheat was sown directly after pickling a fine powder came off the wheat, and interfered with the feeding of the drill. Mr. Trezona wished to know if super. ever killed wheat. Mr. Wharf had mixed wheat with super. and sown it together through the manure box of the drill, and

it did not kill the wheat. Also, it did not affect the distribution of the seed, as it came up as regularly as if it were sown through the seeder. A visitor had also seen farmers adopt the same plan with good results.

ANNUAL REPORT.—The Hon. Secretary reported that the past year had been one of success for the Branch. In keeping with the general advances continually being made in agricultural matters, this Branch had through its members been conducting experiments with manures and varieties of wheat, to ascertain the best of each for the district. There had been seven meetings held, and the number of members now on the roll was 23, being an increase of six. Subjects dealt with were—"General Farming," "Seeding," "Fallowing," "Horses," "Price of Wheat at Outports," "Wide Tyres v. Narrow," "Effect of wet Season on Crops," "Co-operation in Purchases and in the Erection of Storing Sheds for Wheat," &c. Good discussions had taken place, and most members were agreed that for this district 3in. to 4in. was the best depth to plough; 45lbs. of wheat per acre the quantity for sowing on stubble land; and 40lbs. to 60lbs. manure. On fallow, 50lbs. to 60lbs. seed, and 60lbs. to 80lbs. manure. The most reliable pickle for wheat was bluestone— $\frac{1}{2}$ lb. to a bag of wheat. To check the sand drift, planting rye was tried and proved to be a great success. It was to be more extensively planted for the same purpose this year. Manure tests showed that bone super. gave the best results. An application of 56lbs. per acre resulted in a yield of 13bush. wheat, as against 8bush. 54lbs. from the no-manure plot: and in another case 112lbs. bone super. gave 15bush. 30lbs. wheat, as against 9bush. 10lbs. from the unmanured plot. Seed used was Federation, and all other conditions were exactly the same. In another part of the district Mr. Kenny had sown 21 bags each of several varieties of wheat under as nearly as possible similar conditions as to soil and manure. He reaped the following totals:—Carmichael's Eclipse, 238 bags; Federation, 268 bags; Silver King, 235 bags; Yandilla King, 360 bags; Budd's Rust-proof, 308 bags. The past year had been the wettest recorded for years, and the crops appeared to suffer from this cause, and also from frost.

CASTRATION OF COLTS.—Mr. Kenny read a paper on this subject, in which he advocated throwing the colt for this operation. He considered the animal should be in a relatively low condition at the time, and it should be done in the hot weather. He had castrated 22 colts in the past two seasons with very little ill effect being noticeable in any case.

Shannon, May 21.

PRESENT.—Messrs. Proctor (chair), J. and M. Cronin, W. M. (jun. and sen.), L. B., and E. B. Smith, S. and J. Carey, G. and N. Gordon, W. and H. Glover, Williams, Vowles, Irons, Halbner, J. J. Cronin (Hon. Sec.), and 10 visitors.

FENCING.—A short paper on this subject was read by Mr. N. Gordon. Although up to the present very little had been done in this district in the way of fencing, the time was coming when conditions would render it expedient to erect fences of a fairly substantial type. The only posts obtainable here were pine, and these if used should be charred at one end to prevent the attacks of white ants. A good fence could be made by putting the pine posts a chain apart, with two iron posts between. Two plain galvanized wires used in conjunction with netting were sufficient, with barbed wire at the top. The bottom of the netting should be buried in a trench 3in. deep to prevent rabbits from getting underneath. Two feet six inches was sufficiently deep for the posts to be sunk. Discussing the question, Mr. Cronin thought very little fencing was required in new hundreds. Members generally agreed, however, that it was advisable to erect fences as soon as possible, for many reasons. It was thought necessary to put at least three iron posts between the pine posts that were a chain apart, and Mr. Smith, sen., thought strainers should be 3ft. or 4ft. in the ground, according to the soil. Mr. W. Smith found it unnecessary to char the posts.

SHOOT-CUTTING.—Mr. Gordon also read a paper on shoot-cutting, as follows:—"The local method of destroying he considered too expensive. The twin-disc cultivator destroyed a fair number of shoots, but there was need of something that would destroy them altogether. This, he thought, was to be found in the fire rake. It was the cheapest, quickest, and most effective way of dealing with the trouble. With an 18ft. rake from 30 to 35 acres per day might be dealt with, whereas 10 to 12 acres was a fair day's work by the present method. If stubble land was burnt three years in succession all the shoots would be killed. The land was also sweetened by the fire, and better crops resulted. In the discussion which followed, Mr. Cronin was of opinion that three stubble burns

were insufficient to kill the shoots. Others considered that the writer of the paper was correct in his view of that matter, and the general opinion seemed to be that the fire rake was the best contrivance to deal with these shoots.

QUESTION Box.—A number of questions were asked through the question box, and the following replies were elicited:—For fallowing, the best plough was thought to be that made by C. H. Smith. The best quantity of wheat to sow on fallow was thought by some to be from 40lbs. to 50lbs. per acre, and by others 60lbs. was considered to be a fair quantity. It did not pay to buy an old horse, especially in a new district where feed was scarce. An old horse was dear at a gift. Gum posts for fencing purposes were superior to those cut from pine. Members were unable to agree as to the cause of the low returns reaped in the Port Lincoln district. Some thought the quality of the land was poor, while others considered that with proper working the land on this peninsula was equal to that of the mainland for wheat-growing. For green feed some preferred to grow rye, others rape, and one early wheat, grown on land which had been grubbed and treated with stable manure. The land to be one year under crop and the next fallow. Another member thought it best to grow clover, on account of the benefit derived by the soil as well as the good feed secured for stock. Not later than May was said to be the right time to sow wheat in this district. Shallow ploughing was the proper treatment for new land the first year. Mr. Cronin would plough 3in. or 4in deep every year. Fallowing should be got on with as soon as possible after seeding. Fallow should be worked down as fine as possible in this district, to retain the moisture. It could then be easily worked at any time. Pickling was thought by the majority to be best done with the tub, but some preferred the trough.

Utera Plains, May 21.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), Chase, Barber, Pulford, Lee, Hill, A. and C. Venning, Gale, Haines, Guidera, H., T., and R. Hornhardt, J. and M. Abrook, Ramsey (Hon. Sec.), and five visitors.

WATER SERVICE OF FARMS.—In view of the prospect of water being laid on to the different holdings of members, the Chairman read a paper dealing with the question of the convenient situation of taps, troughs, &c. The water should first be taken to the homestead and the stable yard. Troughs, in his opinion, were best made of cement, as they kept the water cool in summer. They should be so placed that the stock could drink whether inside or out of the yard itself. The safest way to keep the troughs full was to have ball taps fitted. With these there was no trouble, and no chance of leaving the tap on and the water running to waste by mistake. Tanks and dams should be kept in good order, and full if possible, as the reliability of the proposed water service had yet to be proved. Discussing the question members thought it impossible to pay too much attention to the matter of water supply. Great care should be exercised to place troughs, etc., in the very best place. A little care would save a lot of work later on.

MALLEE SHOOTS.—Members wished to know what is the best time of the year to cut mallee shoots so as to kill them. [Will other Branches discuss this matter of killing mallee shoots, so that an expression of opinion may be forthcoming from all the mallee districts of the State?—Ed.]

Yallunda, April 23.

PRESENT.—Messrs. Olston (chair), Provis, Liddy, Fairbrother, Wood, Price, F., T., and J. Allen, and Richardson (Hon. Sec.).

MANURES FOR WHEAT.—The Hon. Secretary read a paper on this subject as follows:—“The king of fertilisers is stable manure. Farmyard manure is the only manure in which all the necessary constituents for the successful growing of crops are present in such a form as to be readily taken up by the plant. Special consideration should be given on every farm to the storing and application of stable manure. The best means of dealing with this product must vary considerably with the district in which it is to be used. It is calculated that one ton of farmyard manure contains as much nutrient as from 45lbs. to 75lbs. of sulphate of ammonia, and from 35lbs. to 79lbs. of superphosphate. If this is so, then it needs only half an eye to see the great value of this so often neglected farm product. Long, fresh, hot manure should be applied to the stiffer clay soils, as the nature of these soils is such as to retain those ingredients which become available as plant food comparatively slowly, whereas, when the shorter or well rotted dung

is applied to light sandy soils, which have but little retentive power, the plant food will be used at once and not wasted. Again, long manure tends to open up heavy soils, and short dung to render open porous soils more retentive. One soil ingredient which it might be profitable for us to consider is lime. I have been told that samples of local soil have been analysed and been found deficient in lime. All plant life needs a certain amount of lime, and unless there is from 1 per cent. to 2 per cent. present, the soil may be said to be deficient. Another good reason for the presence of lime is that phosphates applied become available for plant food much more easily where there is a certain amount of lime than when there is a deficiency. Like farmyard manure, it has good effects on all types of soils. If applied to clay land it will render it more friable, and if to loose porous soils they are made more cohesive. Ground quicklime can be obtained at a cost of about 30s. per ton, and this is the form in which it is recommended to apply it, and, I think that we all might try a little of this. Lime has a beneficial effect in other natural processes, and is an aid to the processes of nitrification and the decomposition of such organic matter as may be present. The three other principal soil constituents which are liable to be absent or insufficient are phosphates, nitrates, and potash. The first-named is one which it is generally considered all South Australian soils are deficient in, and it is usually applied in the form of superphosphates. As to the most profitable amount to apply opinions differ. It would not be a wise policy to apply 2s. worth extra per acre of phosphates and only to reap 1s. extra worth of products; but if the reverse can be obtained, then assuredly heavier applications will pay. Although heavier applications may not have a very great influence on the cereal crop, the feed which grows on heavily manured land is much better and more luxuriant than that on land only manured with sufficient fertiliser to supply the cereal crop. Phosphates will not leach out of the soil to the same extent as nitrates will, and so if there is any surplus phosphoric acid in the soil the major portion is retained for the use of the next crop. It is thought that there is no necessity at present for the use of nitrogenous manures in this State, but whether our particular district would be improved by a judicious application of these manures has yet to be proved. Nitrogenous manures are recommended for use in cold wet districts, and it is a question as to where these conditions could be more nearly fulfilled than in Koppio. I have thought that if we could stimulate our crops at the time when they are lying wet and miserable, one step would be made towards the growth of heavier crops. It would be an interesting experiment to top-dress a small area with nitrate of soda during the wet period, or perhaps, immediately after, in order to satisfy ourselves as to whether this manure would have any stimulating effect. As regards potash, I do not think that there is at present any likelihood of a shortage of this constituent, as the vast amount of timber annually burnt must have a beneficial effect." The paper was well discussed.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Coonalpyn, March 26.

(Average annual rainfall, 17 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Hill (chair), Bane, Fidge, Venning, Liersch, Wall, and Cavanagh (Hon. Sec.).

VARIETY TESTS.—Mr. Venning reported the following results from the wheat variety test conducted by him on behalf of the Department of Agriculture:—"Dart's Imperial, 3bush. 57lb. per acre; King's Early, 4bush. 23lb.; Gluyas, 4bush. 53lb.; Newman's Early, 5bush. 14lb.; Yandilla King, 5bush. 42lb. Mr. Venning explained that the plots were all damaged by excessive moisture, but were about equally affected.

Coonalpyn, April 29.

(Average annual rainfall, 17½in.)

PRESENT.—Messrs. Hill (chair), Bone, Vinning, Wall, Fidge, jun., Liersch, Cavenagh (Hon. Sec.), and one visitor.

LUCERNE.—Mr. Hill showed members a photograph of lucerne which was growing at Tintinara. All were of opinion that this fodder could be grown here with proper cultivation.

SUPERPHOSPHATE FOR CEREAL CROPS.—In answer to a question, Mr. Hill said that, judging from appearances, the best crops, both for hay and grain, were those which had had heavy dressings of super.

RINGNECK PARROTS.—Mr. Vinning wished to know how to protect his fruit from the ravages of these birds. He had tried shooting them, but that method was not successful. He would like to know whether members of other branches had had any success in keeping these robbers away from their fruit.

Lameroo, April 23.

(Average annual rainfall, 16in.).

PRESENT.—Messrs. Emie (chair), Cameron, Wittwer, Wray, Sinclair, Hannan, Skinner, Dunston, Thyer, Ross, Edwards, Leckie, Gibbon, Emie, Messenger, Kentish, Koch (Hon. Sec.), and two visitors.

HARROWING AFTER DRILLING.—Mr. Kentish read the following paper:—“With a good free soil little if anything is needed after the drill has passed over it. But when on account of the stiff nature of the soil, and on account of numerous stumps, or rain falling between the processes of cultivation and drilling a good deal of wheat is left exposed, some covering process is necessary. How to do this work efficiently while adding as little expense and labor as possible is a problem which concerns farmers. Probably nothing does this work better than the ordinary harrows, but the labor and delay of a separate operation seems hardly warranted, especially when we have large areas to deal with, and horse-feed and horse-flesh are such important considerations. A light harrow behind the drill such as is made locally is worthy of consideration. These harrows add about half a horse to the draught of the drill. I used them last year, working four horses in a three-horse drill. They answer very well wherever the land is tolerably free from snags. It proved to be best to draw them from one draw bar in the centre of the harrow. The two draw bars keep them too evenly balanced, and they do not give readily to the stumps and snags, and are liable to be doubled up. Among numerous stumps these harrows do their work well. Instead of skipping clean off the ground when a root or snag is struck the free side sweeps forward, the work is done, and the risk of damage minimised. I found, however, after working them for some weeks that the metal became brittle with constant friction, and the frequent breaking of tines was rather a nuisance. I cannot speak from experience of the value of Campbell's cocktail harrows. I have bought a set, but have not yet begun sowing. We can hardly look at them, however, without feeling that the inventor has grasped the right idea, and he deserves a trial by mallee farmers. Those who have used them say that they add about half a horse to the draught of the drill, and that they do their work very efficiently and with very little risk of breakage. The cost of these harrows is not large.” The question was well discussed. The small harrow referred to was considered to be the cheapest implement to use, but it was thought to be rather ineffective after rain. A full set of harrows was thought best. This in most cases required an extra team, and sometimes stopped the work of the drill or cultivator. Mr. Thyer thought the disc attachment of Norman & Co. an improvement on the sectional harrows. Mr. Emie had found the crops on unharrowed ground to be thinner, but higher than those which were harrowed. The Chairman always harrowed after drilling. He thought it would pay better to crop less ground than to omit the harrowing.

PICKLING SEED WHEAT.—In answer to a question the Chairman said he had found no smut (blunt) on wheat pickled with fungusine, but a little was noticeable on that which had been treated with the bluestone solution. Mr. Kentish quoted an instance in which the positions were reversed. Mr. Wray pickled with bluestone and salt, a quarter of a pound of the former and a handful of the latter to each 3bush. bag of seed. He had no trouble from smut,

Morgan, May 21.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Wohling (chair), Hempel, Heppner, Keough, R. Wohling jun., and H. Wohling (Hon. Sec.).

IRRIGATION.—Mr. Hausler read a short paper on irrigation. It was essential for successful work with irrigation that the land be thoroughly cultivated, levelled, and graded. On level ground it was a comparatively simple matter to raise parallel ridges to conduct the water, although it entailed a good deal of hard work. The channels were required on each side of the plot to be irrigated. The banks could then be opened at four or five places and the water run into the plot until it reached nearly to the opposite side. Then, having opened another outlet from the channel to some other plot, so as to avoid bursting the banks, the inlets to the first plot could be safely closed. If there was a plentiful supply of water it could be run into the plots from both sides at once until the two sheets of water nearly met in the middle. With carefully graded land and well conducted irrigation practically anything could be grown on the soils of this locality.

BLACKSMITHING ON THE FARM.—A paper on this subject was read by Mr. Wohling, jun. Although not a very expensive item to fit up, a small forge on a farm was of great importance. Time was money, and the loss of time entailed in taking a broken implement to the blacksmith was often very great. On the other hand, if the farmer felt disinclined to suspend farming operations while these repairs were effected in the town and tried to fix up an implement or machine with such rude material as fence wire, some serious strain to the machine might be expected to result. The value of the forge at hand was therefore apparent. With very little delay a small trouble could be put right, and probably some more serious difficulty be averted. Spare time could be profitably employed in making eyebolts and hooks. It was also worth while to procure stock and dies, so as to be able to thread or re-thread bolts, &c., at any time. Members thought that, if possible, every farmer should have some such equipment as that referred to in the paper.

Murray Bridge, May 23.

PRESENT.—Messrs. McIntosh (chair), Doyle, Nelson, F. W. and J. Lehmann, Davie, Steeker, Schottelius, Taylor (Hon. Sec.), and one visitor.

POULTRY STATION FOR MURRAY BRIDGE.—Mr. F. Lehmann thought it would be a very good thing if a poultry station were established at Murray Bridge. He said that the Poultry Expert had expressed himself in favor of such a proposal. A resolution was then unanimously carried that this Branch is strongly in favor of the establishment of a poultry station at Murray Bridge as early as possible.

RECLAMATION AND TREATMENT OF SWAMP LANDS.—The Chairman read a paper on this subject. The paper will be found on another page of this issue.

Parrakie, May 14.

PRESENT.—Messrs. F. J. Dayman (chair), Willis, Wittwer, Bottroff, Morrison, O., C., and H. Heinzel, Short, J. Dayman, C. W. J. and J. Burton (Hon. Sec.), and six visitors.

POULTRY ON THE FARM.—The Chairman read a short paper dealing with poultry on farms. He thought that, properly cared for, fowls would pay to keep. The best fowls for a farm, he considered, to be purebred White and Brown Leghorn roosters with ordinary common hens. These produced hardy fowls, fairly good for the table, and really good layers. The best time to hatch chickens was from the middle of August till a month later. Pullets hatched in these months would lay when eggs were dear. In view of the difficulty experienced in getting hens to sit at the time of the year named he advised the use of an incubator. A little more trouble was involved with the use of this appliance, but it was well paid for in getting birds that would lay when eggs were scarce. The subject was well discussed. Mr. J. Dayman thought the best fowls were crossbred Game and Leghorn. They were hardy, good layers, and made good table birds. Mr. Short favored the Minorca-White Leghorn cross. Mr. Burton spoke of the Langshan as a good winter layer, but most of those present agreed with the writer of the paper.

Rhine Villa, May 20.

(Average annual rainfall, 10½in.)

PRESENT.—Messrs. G. Payne (chair), F. F. Payne, Deane, Hecker, Mickan, and Vigar (Hon. Sec.).

FALLOWING.—A short paper on this subject was read by Mr. Deane. In his opinion, farmers should fallow the greater part of the land intended for the following year's cropping. Much better yields had been realised since fallow had come into general use. Firm land should be well worked after very heavy rain, to prevent it from becoming sodden, and to retard evaporation. Fallow on sandy land should be worked very shallow, or sand drifts might be expected to result. He believed in fallowing as early as possible. In this district all fallowing should be completed by the middle of August, as if the land was fallowed after the grass was in seed the succeeding crop was more liable to takeall. The present season showed the value of having plenty of fallow. Those who had none were backward with seeding, as the land had been too hard for ploughing. A good discussion followed, members agreeing generally with the paper. Mr. F. Payne advocated light back ploughing fallow before seeding. The Chairman thought it unwise to fallow sandy land, owing to its tendency to drift in dry windy weather.

Sherlock, April 30.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Wood (chair), Osborn, R. H. and F. C. Stringer, Nock, Nicksch, Coombe (Hon. Sec.), and three visitors.

ARBOR DAY.—Mr. Osborn commented favorably on the paper written by Mr. Ball, of Angaston, and published in the April issue of this *Journal*, and then proceeded to read the following:—"In this district, when the native mallee scrub and its attendant under-growth has been abolished, we shall, unless landholders follow a sound course of tree-planting, have nothing but a large open plain, practically denuded of anything that could be called a tree. The Government afford every facility to the scrub farmer and others to convert their present barren-looking holdings into picturesque farms. Every year many varieties of ornamental trees are distributed by the Government from various centres, and anyone applying can obtain them. In 1908 I obtained a parcel of trees comprising a few bluegum, sugar-gum, tamarisks, and pines; these were duly planted, and I have the satisfaction of seeing a large percentage of them growing. The gums are about 6ft. high, the tamarisks range from 4ft. to 6ft. in high, the pines are slower growing, but are looking healthy. Last year I obtained a further supply of trees, comprising white cedars and white acacias; these were planted, and what were apparently pieces of stick a foot in length are now healthy-looking trees, the cedars looking exceptionally well. This country was originally fairly heavily timbered, as is proved by the large dry trunks of trees occasionally met with; therefore there is no apparent reason why we cannot again have large shady trees growing here. I have found that the fowls pick the leaves of the white acacia, and horses like the tamarisks; therefore I have had to place wire netting around my present reserve; but if gums and cedars were planted, this course would not be necessary." Mr. Ball sensibly remarks, "The time is not far distant when timber trees suitable to local conditions and fit for any commercial use will be a valuable asset, and tree-planting may be regarded as a sound commercial speculation, and worthy of the consideration of every landholder." Another aspect of the question is the fact that wherever a country has been denuded of its native timber and other trees have not been planted the rainfall has materially decreased; therefore we must awaken to our responsibility in this matter. There can be no reasonable excuse offered by any landholder for not doing so, because the Government provide the trees. The slight trouble involved in planting, and wherever possible watering, the trees, is as nothing compared to the improvement made in the appearance of our holdings by rows of trees being planted alongside our dividing fences, boundaries, and corners of paddocks." Members thought that much good could be done by educating children on the matter of protection to trees and other property, and generally agreed with the views expressed in the paper.

SEEDING.—In answer to a question, members agreed that it was quite safe to proceed with seeding operations under existing weather conditions, as the ground was sufficiently dry, and it was unlikely that the grain would malt.

HARROWING GROWING CROPS.—All those present agreed that it was advisable in this district to harrow the growing crops. The destruction of a small proportion of the young plants was more than compensated for by the general benefit to the whole crop.

Sutherlands, May 21.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Snell (chair), Byrnes, Broadbent, Mibus, Dohnt, Francis, Doecke, Twartz (Hon. Sec.), and one visitor.

FORESTRY.—The Chairman read a paper on “Forestry.” Having given some statistics from the annual report of the Woods and Forests Department to show what the department was doing in this matter, he then proceeded to say that he considered that each man on the land, whether his own or leased, should plant trees on every available piece of spare land. The fact that older countries were running short of timber should be a lesson to Australians to keep on planting timber for those who were to follow. The once much despised mallee was now looked upon as an asset on account of its value as firewood. He would like to see a good deal more public money spent in encouraging settlers to plant timber of various kinds in all parts where it would grow. Members were heartily in accord with the views expressed in the paper, and thought it might even be well to adopt some measures to compel landowners to plant trees, as was done in other countries. They considered that the sugargum was the only tree suitable for this district.

Waikerie, May 10.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Borroughs (chair), Rogers, Modestack, Perry, Morgan, Burton, Green (Hon. Sec.), and one visitor.

BADLY GRADED FRUIT.—Mr. Burroughs drew attention to the report of the Trade Commissioner complaining of the badly graded dried fruit sent from South Australia to the London market. Exception was taken to the statement, and it was said that the fruit from the Murray was as well graded as could be found in the Commonwealth. There was not an old-fashioned machine on the river. Members thought that if the same attention was given to the disposal of dried fruits in the European markets as was paid to the disposal of apples and eggs better prices to the growers would result. Mr. Rogers tabled some dried fruit sold in town as apricots at 6d. per pound. These were black and mouldy, and yet the same price was paid for it as for the prime samples from the Murray. Members wondered that the Australian Dried Fruit Association allowed this sort of thing.

Wilkawatt, April 19.

PRESENT.—Messrs. W. Bowman (chair), H. and W. Brooker, C. and T. Sorrell, Harvey, Tyler, Neville, Ivett, O’Shea, D. Bowman, Gregurke, and Short (Hon. Sec.).

SOWING CEREAL CROPS.—Mr. D. Bowman read a paper on this subject. He advocated having as much land as possible worked early, say by the end of April. It should be either ploughed or cultivated, and if it turned up roughly should be harrowed before sowing. If the land was well worked the seed could be put in at a uniform depth, and the crop would be level. Harrowing was not easy in this district on account of the rubbish turned up in cultivation, but if the harrows did not work well, a disc cultivator run lightly over was a good implement to use. He would sow before the rain set in without pickling the seed, but if sowing after rain would have the seed pickled first. It was not wise, in his opinion, to have the seed pickled too long before sowing, as there was danger of its germinating in the bag and being damaged in the drill. Members generally agreed with the writer of the paper, excepting that they thought there was little danger of the pickled wheat germinating in the bag as suggested.

GRADING, SELECTING, AND HYBRIDISING WHEAT.—The following paper on this subject was read by Mr. Harvey:—“Seed planted year after year just as it grows, causes a rapid degeneration of the crop, and the efforts of all the experimental farms and stations of the world have been to produce just the opposite effect. It pays to have seed well cleaned and graded to a uniform size; it means a clean crop, free from weeds, and the seed can be sown more evenly because of its uniformity. Being free from chaff, there is a larger percentage of growth. The plants from such seeds are larger, thriflier, and more resistant to disease, drought, and starvation. The yield per plant, both of grain and straw, is greater from such seed. The continuous grading of seed thus tends towards a general improvement in the quality of wheat. Experiments have shown that crops from land sown with good clean seed of uniform size will not only head up and ripen evenly, but will give a heavier yield. Although good seed produces good crops, if the best seed

is put in badly cultivated land it may not do so well as inferior seed sown in properly prepared soil; but it is certain that, all other things being equal, the superior seed must have an advantage. Selection can be practised by any farmer. It simply means going through his crop and selecting the choicest heads. These are cleaned and graded and then sown in small seed beds, the produce from which may be planted in larger plots the next year for seed wheat. The farmer who goes in for selection is improving the quality and cropping power of his wheat. Some authorities claim that you can obtain all you require in the direction of wheat improvement by selection. At Roseworthy College an increase in the yield of King's Early—now known as King's Red and King's White—from 12bush. to 26bush. per acre has been accomplished by means of selection." The writer then gave some information regarding cross-breeding of wheat in America, speaking of the results aimed at and the difficulty of producing a wheat that proved better than its parents. He also spoke of the work being done by the department in the same line, reports of which have been printed in this *Journal* from time to time. Members agreed that it was of little use to carefully prepare the land if reasonable effort was not made to secure good seed to sow in it.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, April 19.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Stone (chair), Jacobs, C. and I. Ricks, J. and C. Lewis, Chapman, Broadbent, Curnow (Hon. Sec.), and six visitors.

TREES BLOOMING OUT OF SEASON.—Mr. Jacobs mentioned that an apple tree of the Quarrenden variety was now bearing a good second crop of fruit, and it was again in flower. This second crop was of fine large fruit; such fruits as the apple, pear, cherry, and plum, were also blooming freely, and in some cases the blooms were quite as profuse as in spring. The blackberry bushes were also coming into leaf. Mr. Stone mentioned that his strawberries were quite white, and he wondered whether next season's crop would suffer in consequence.

HATCHING.—Mr. Ricks read a paper on thatching. After speaking of the importance of thatching in such countries as England, where until a few decades ago so many of the country houses were roofed with thatch, as well as shelters of all kinds for animals, implements, &c., he proceeded to describe the methods of thatching employed in those parts, as follows:—To prepare a sufficient quantity of wheat straw (which should be as long as can be procured), spread out a layer on the ground with a hay fork, and sprinkle it thoroughly with water. Then put another layer on and serve it in the same way, continuing this process until the whole lot is damped. This is left in the heap for a day or two, by which time the straw will have become quite tough, and will not break when handled. Then draw out handfuls of the straw and straighten with both hands, pressing it against your legs and so make the thatching sheaf, known in the part from which he came as an elm. These are placed in a stack 4ft. high, and remain there till harvest time. To thatch the stack, take the elms one at a time (they may be carried in a forked stick), push the top end into the stack, and spread it out in the usual way, and repeat till the top of the stack is reached. Then with a flat stick, or hay rake, on a handle 4ft. long, give the elms a few flattening knocks, and rake out any loose straws. To keep the thatch on a better and quicker method than that of string and straight sticks, as used here, was the use of speakes and ledgers. The ledgers consist of pieces of wood 4ft. long, laid on the thatch at the proper intervals. These are kept in position by staples, made with one end longer than the other, from hazel wood. The wood is cut and put into water to soak. This makes it tough and pliable, and it can then be bent into the desired shape. These staples or speakes are driven through the thatch into the stack, and hold the ledgers firmly in position. For thatching sheds, houses, etc., the process was a little different. The ledgers were used as before, but were laid in the middle of the elms, and were sewn to the battens underneath with thin tarred rope. The top and bottom sheaves were fixed with both ledger and speakes, and these were also all that was necessary to put a new thatch over an old one. When in the Port Lincoln

district the writer had seen very good thatches made from what was known locally as thatching grass, sewn on to the battens without the use of anything corresponding to the ledgers, and the owner had found this to keep out all weathers. Rushes of all kinds were successfully used for this purpose when obtainable. The thatches could be trimmed up after all had been made safe from the rain.

Forest Range, May 21.

(Average annual rainfall, 36in.)

PRESENT.—Messrs. Vickers (chair), A. H. J. and R. Green, Rowley, Waters, Allen, Tribe, McLaren, Pollard, Monks (Hon. Sec.), and three visitors.

A GOVERNMENT JAM, CANNING, AND PULPING PLANT.—The following paper on this subject was read by Mr. Waters :—“ There has been a deal of talk amongst fruitgrowers about the low prices which have been obtained for various kinds of fruit. In the past most of us as fruitgrowers know and feel what it is to have a good crop of fruit and then to get a miserable low price for it. Oftentimes it is much more profitable to have a small crop than a large one. This naturally leads to the question of the establishment of a Government factory, where the different kinds of fruit may be canned, or pulped, or made into jam. I take a national view of this matter, and, seeing the good results of the Produce Depot at Port Adelaide in the meat and butter industry, I thought— Why should not such an article of every day consumption as jam be also included in the category ? I expect to receive adverse criticism, as this suggestion treads heavily on the toes of private enterprise. Seeing that jam is as much an article of diet as butter Why should not the Government give it as much attention as it has done to the butter industry ? I am of opinion that if this matter of a Government factory is placed before Parliament, with an extensively signed petition of *bona fide* fruitgrowers showing the urgent necessity of such a factory, that they would be in duty bound to accede to the request ; or otherwise it would look like showing a preference to the dairyfarmer and ignoring the fruitgrower. However that may be, the time has arrived when something should be done, as the fruitgrower is placed just now entirely at the mercy of the jam-makers of this State. It is all very well for the jam-makers to say that they give the top price, and that they have to compete with outsiders ; that does not alter the fact that the fruitgrowers of this State have to take ridiculously low prices for their fruit. In the event of the Government not seeing their way clear to take up the manufacture of jam, &c., they should, in order to build up a trade with other countries, offer a bonus of so much per ton or case. We have read of other countries building up certain trades by offering bonuses or protecting them by high duties, and then, after a few years, the bonuses have been withdrawn. These same countries have benefited enormously from such legislation. One of the most helpless positions in which fruitgrowers are placed in this, that instead of fixing a price for their fruit, they have to go cap in hand to the jam manufacturer and say, ‘ How much are you going to give ? ’ Fancy the grocers round the East End Market running around the gardeners saying, ‘ What price are you giving this morning for tea, sugar, &c. ? ’ The position is so absurd that, were it not for its seriousness, one wou'd be inclined to think that the fruitgrowers of this State were not much better than a lot of schoolboys. I am aware that a proposed company, named The Co-operative Fruitgrowers' and Grocers' Preserving Company, is being formed, but what of that ? Has not the same thing, or similar to it, been tried before, viz., the S.A. Fruit and Vegetable Co., and with what result ? I emphasise this fact that the proper thing to do is to petition Government to establish a factory, and thereby place upon the market a pure article at a reasonable price.” Mr. Allen thought this might well be undertaken by the Government, as they were better able than private individuals to find markets for such products. The establishment of the Government Butter Factory had had a steady effect on the price of butter. He did not favor the bonus system, but thought the Government could give better satisfaction by establishing a plant at the depot than could be given by any co-operative concern. Mr. Tribe thought it would be more economical to do the pulping in the various country districts. Mr. H. Green thought it would be difficult to give effect to that suggestion, as it would involve so many interests. Mr. Rowley thought that as the Government had taken up other lines they would do well to do the same with this. It would then be run in the interests of the community. Mr. McLaren thought that if the Government took up the pulping of surplus fruit that would be all that was needed.

Golden Grove, April 21.

PRESENT.—Messrs. Robertson (chair), Robertson, Ross, Maxwell, and Harper (Hon. Sec.).

SELECTED SEED FOR HAY.—The Chairman read a paper on the question of special hay-wheats for seed on small holdings of up to 500 acres area, as follows:—"The question to be faced is whether it will pay to experiment with different varieties of wheat for hay. In my opinion it certainly would pay for every farmer to sow a few varieties of wheat, which he thinks would suit his locality best. By this means he would be in a position to judge for himself, and select any of the most promising wheats. There are many points to be taken into consideration when selecting wheat for hay, but the principal one is—which will give the heaviest yield per acre with the minimum amount of bulk; and at the same time make a sound sample of good chaff. Some hay-wheats, such as Medeah, Atalanta, African Baart, &c., will produce heavy crops per acre, and yet I do not consider that many farmers would keep it to feed their own horses on, on account of the strong beard, which makes the animals mouths sore. I believe that the most popular hay-wheat ever grown in this district is Gallands Hybrid. Being a very late variety it suits the hills districts and the south much better than the plains north of Adelaide. In addition to producing a big crop of hay per acre of a sound marketable character, it has the great advantage of benefiting the land for the next crop, almost as much as a crop of peas. If a crop of Tuscan, Baroota Wonder, or Leak's Rust-proof is grown where a crop of Gallands Hybrid has been previously, the beneficial effect of the latter will be quite apparent. There has been a strong demand for this variety of wheat for seed for many years past, and we have found it very profitable to grow, as it yields well, and the grain is always easy to dispose of at from 5s. to 7s. per bush. We have also found that it pays better to head this or any other variety which produces a very long straw than to risk leaving it till it is ripe enough to strip. The headed hay makes excellent feed for sheep when chaffed up and horses do well on it when not working too hard. Of course the process of heading involves a lot of extra labor, but if one takes into consideration the risk of loss from strong gales or thunderstorms which frequently occur before the wheat is ripe enough to reap, it is worth the extra trouble. Every care should be taken to keep seed wheat pure and true to name if one wishes to build up a reputation for having good seed. This is half the battle in selling seed wheat, as no farmer likes to pay for one variety and then find when it is too late that he has been supplied with something else. The production of special hay-wheats would give ample opportunity for co-operation amongst farmers in a district such as this, both in controlling the price and the quality of sample, also in advertising and securing suitable machinery for threshing, cleaning, and grading. A portable header with elevators, winnower, and bagger combined might be used by several farmers in turn, as also might a good grader. One farmer may not care to invest in the whole plant, but together it would be an easy matter. Another hay-wheat which has been profitable of late years is Huguenot, which has been tried with good results in many parts of this State. It is solid in the straw, very sweet, and grows up to 7ft. in height. It also yields a large quantity of heavy grain. Huguenot is very brittle in the straw if left till over-ripe, and therefore I think it would be harvested to better advantage with the binder and header. To keep up the standard of wheat for either hay or grain production I favor selection rather than change of seed. With large areas of new land being opened up a steady demand is bound to be maintained for good hay-wheats. Farmers on new selections are always in need of something that will provide them with a good crop of hay for the first few years, and therefore I consider it advisable and profitable in a district such as this to devote more time and space to the production of first-class hay-wheats for seed. This will also increase the carrying capacity of our farms by providing straw for stock or sheep." Discussion followed, and those present appreciated the practical suggestions made in the paper."

Hartley, April 23.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Wundersitz (chair), Tydeman, Paech, Brook, Symonds, Hudd, Phillips, Stanton, and Bermingham (Hon. Sec.).

BREAKING HORSES.—Mr. Hudd addressed the meeting on this question. He considered the best means of catching a colt was with a whip, but it must be done gently and in a small yard. Before putting him in harness the flank rope should be put on to make him kick. After this he could be made to pull a log, and would probably not kick again. A colt should be put on the rein when pulling plough or harrows, as then, if he

came back he would not be so liable to bring the team back with him. If intended for driving or riding he should be mouthed, but it was not usual to mouth a draught colt. It was a mistake to break in animals too young. If left till three or four years old they would last much longer. If broken earlier than this the greatest care should be taken not to overwork them. Mr. Hudd exhibited a halter made of stout rope, which was admired by members. They considered it better to use this than to tie up an animal by the neck.

Hartley, May 21.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. B. Wundersitz (chair), O. Wundersitz, W. and C. Brook, Clark, Hudd, Pratt, G. and T. Phillips, Paech, Tydeman and Bermingham (Hon. Sec.).

FALLOW.—Discussion as to the best way to keep fallow free from weeds took place. The skim plough was considered to be the best implement to use in wet weather, and the cultivator in dry weather. It was thought necessary to cultivate and then cross cultivate, afterwards harrowing to get all the weeds well on the surface and exposed to the sun. It was the general opinion that the ordinary four-wheeled cultivator needed some improvement. The front carriage had a tendency to run first one way and then the other, thereby missing many weeds which would be killed if the implement ran true. Some members were rather doubtful whether it paid to fallow in this district, as it was so much trouble to kill the weeds, the dandelion being especially hard to get rid of. Most of the land in this district, being of a stiff nature, set down too hard to work unless it was done soon after a good rain. If a less area were fallowed, therefore, the remainder could be more readily worked at the opportune time. All agreed that it was a great mistake to put in a crop unless the weeds were well worked out first. The scarifier harrow was considered a good implement where no stones or stumps were met with, but it must be used when the weeds were small.

Kanmantoo, April 22.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Hair (chair), Downing, Lewis, Lehmann, W. G. and W. C. Mills (Hon. Sec.).

HARVESTING.—Mr. Lehmann read a paper on harvesting. "Harvesting," he said, "should be accomplished as speedily as possible, as there was always a loss going on after the crops were ripe until they were harvested." In level country such as the Northern plains, the complete harvester did good work, and was largely used on account of the labor saved. In the Wimmera District of Victoria, while a number of harvesters were used, a great deal of the work was done with the stripper, motor winnower, and the thresher. The objection to the harvester was the loss of the chaff and the extra horse-power needed. The machine also required intelligent handling and was not suitable for sandy and rough country. The stripper would take the crop off more quickly than the harvester, and an earlier start could be made with it than with the latter. Low wheat and rough country could be dealt with by the stripper where the harvesters would do but indifferent work. The cocky chaff in some mallee districts was used for horses and other stock in the winter and kept them in good condition, with the addition of a little molasses and oats. The motor winnower did in days as much work as a hand machine could put through in weeks. With it three men could clean from 200 to 400 bags of wheat per day. The binder and thresher should, in his opinion, be used a good deal more than they were in certain districts. If barley and oats were left for the stripper to take off the losses were sometimes very great. In rust seasons also a better sample of wheat would be obtained by the use of these implements. The value of the straw should pay for the extra cost and labor involved. The crops could be cut 10 days earlier than with the stripper. Practically every local farmer had a reaper and binder, and all they wanted was a suitable thresher. The style of machine used in the South-East was too large and expensive, but there were several smaller American machines on the market which were worthy of notice. He thought they should combine to buy one and have a charge per bag of grain for the use of it to cover all cost." In the discussion which followed some members thought the harvester still held first place, and if worked properly was the cheapest and best all-round machine to use.

LIME-BURNING.—In answer to a question, Mr. Lehmann explained his method of lime-burning as follows:—Dig a hole in clay ground, preferably on a hillside, making a flue from the outside to the bottom of the hole. Put a good layer of kindling wood at the bottom and place on it logs of about 6in. thick. On this put about 6in. of cracked limestone. Repeat the layers of wood and stone alternately, until the pit is full, taking great care that there is not room between the logs for any limestone to slip through. The light is applied through the flue, and then little can be done till the fire has burnt out and the lime cooled.

Kanmantoo, May 20.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Hair (chair), W. and J. Downing, Lehmann, Lewis, W. G. Mills, and W. C. Mills (Hon. Sec.).

FARM HORSES.—Mr. Hair read a paper on "Horses." It was generally admitted that the best horse for farm work was bred from a draught stallion and a roadster or strong blood mare. There was no doubt that this class of animal was very hard to beat. The progeny of the draught stallion was a comparatively mild-tempered animal, and this was an important feature on farms where, owing to the nature of the work, it was necessary to change drivers of teams several times a day. Sometimes the pedigree of a good farm horse could be traced to a pony sire, and although not quite so long in the body as the first-named breed, this class of horse was equally capable of good work. The advent of the Suffolk Punch was expected to have met the need of farmers for breeding purposes, but in his opinion it had not done so. Farmers were not eager to sacrifice good, heavy stud mares after many years of judicious breeding by crossing with the Suffolk Punch stallion. Opinions differed as to whether heavy or light horses were best, but while the lighter animals got over the ground more quickly, they were unable to plough certain soils to the proper depth to ensure an even crop and the highest yield; therefore he would go in for the heavy stamp of horse, which could do heavy work and, after two or three years' work on a farm, could be sold at highly profitable prices. For breaking a colt the driver should try to understand its temper and general disposition. It was bad management to place a colt next to a bad starter, as he was likely to learn from his neighbor the same bad trick. At seeding time he fed his horses with all long hay for a few days, using bran and chaff for dinner. There was then no fear of griping, and it was worth a little trouble to get the horses in good trim for the work without any risk of their getting sick. After the third day they had some oats, but not the full quantity till they were doing full work. Feeding them in this way the skin and flesh became hard, and sore shoulders were avoided. He also gave some medicated crumbs two or three times a week, and some dissolved saltpetre in the damped food to keep the blood cool. If there was a spell of work before the horses of a few weeks duration, he worked them with a bran bag as a false collar to absorb the sweat and prevent scalding. In the ploughing season the horses were only worked for short hours until after the third day, thus bringing them to the work in the same way that a racehorse was trained for a big effort. These simple rules he had followed for some years, and his animals were seldom troubled with sore shoulders.

LUCERNE.—Mr. Lehmann showed some lucerne which was grown on his farm. One sample was from local seed, and two others from American seed. One of the latter was very short, creeping along the ground, and a slow grower. It was not thought of much value in this district. The other American sample was taller, but was not thought equal to the local variety. Mr. W. G. Mills had about three acres of lucerne which he allowed to go to seed and then reaped. He then put about 100 ewes and lambs on it for a month, and since has had 24 ewes and lambs on it for two months. All the sheep had done well. Members wished to know how to get rid of the lucerne flea.

Longwood, April 23.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. W. Nicholls (chair), Hughes, J. Nicholls, Doley, Pritchard, Glyde, Vogel, Oinn, Coles (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. J. Nicholls. Amongst many apple trees inspected the Rome Beauty was found to have a far superior crop to the others, and to be healthier and better in appearance than any other variety in

the garden. Three or four Cleopatras growing about 8ft. from the edge of a natural drain were in a very bad state with die-back. One of these had been well manured and cultivated and had had an application of 1lb. of washing soda, but no improvement was to be seen.

EXHIBITS.—After partaking of tea the business of the branch was transacted, and samples of ensilage and the following apples were tabled, viz., Northern Spy, Adam's Permain, and Mobb's Royal. Of these three the variety first named had the best flavor. An adjournment to the institute then followed, where the following paper was read by Mr. Durward :—

"SPRAYS, THEIR COMPOSITION AND ACTION.—To spray properly and economically it is necessary to understand what we are spraying for. The old-time fruit-grower had foes which he did not understand and could not assail; the general result was that the insect or fungus obtained all the nourishment it required, and the grower got what was left. This is still the lot of the grower to-day who does not spray. There are few diseases to-day which cannot be controlled, and these are fast diminishing in number. It rests entirely with the grower himself whether his apples shall be wormy or not, whether his trees shall retain their foliage, or lose it from disease. Paris Green was the first insecticide used for the destruction of leaf-eating insects, following this came rapidly in succession London purple, white arsenic, Kedzie's solution (arsenite of soda) with lime. All these act as direct poisons on the insect by being taken into the stomach. The preparations above-mentioned are all compounds of arsenious acid, and unless they are used in conjunction with a large excess of milk or lime there is great danger of burning the foliage. The quantity of lime necessary in these sprays has the drawback of frequently blocking up the orifice of the sprayer. All these compounds of arsenious acid are being rapidly replaced by the more perfect and up-to-date arsenate of lead. The chief advantages in using arsenate of lead over all other compounds of arsenic are—1. Its extreme insolubility in water, eliminating any danger of burning the foliage. 2. The fineness of the precipitate; when properly prepared it exists in a form known as 'colloidal,' and has not the same tendency as other spray compounds to settle quickly. 3. It is not easily washed off by the rain. On the application of heat or by the addition of lime the colloidal form is broken up, becomes granular, and settles very rapidly, and also loses to a large extent its tendency to stick; on this account it would be inadvisable to mix arsenate of lead with Bordeaux mixture; this is sometimes done in order to save time, but the effect is to render inert some of the best characteristics of a well made arsenate of lead. Aphides or sucking insects derive their nourishment by sucking the plant juices. As a rule they are easily dealt with, unless they are attached to the root of a plant. Undoubtedly the best means of overcoming them is by means of kerosine emulsions. Some difficulty may be experienced by the grower in making this emulsion, but if he first prepares a solution of resin in either potash or soda, such a solution acts as a splendid emulsifying agent for kerosine, or in fact any other oil, such as whale oil. The emulsion must always be made hot. Scale insects chiefly attack the citrus fruits. If coped with in time they will succumb to a liberal application of resin wash (*i.e.*, a solution of resin in soda or potash), the latter being preferable on account of its easy solubility. Undoubtedly the best method for this disease, however, is fumigation with hydrocyanic acid (prussic acid), prepared by the action of sulphuric acid on cyanide of potash. The treatment of fungus diseases is confined chiefly to the salts of copper, and for the past 30 years Bordeaux mixture has held pride of place. Fungus diseases being all low forms of vegetable life are very easily killed with the soluble copper salts. The soluble copper salts, however, such as bluestone, have a very caustic action on the foliage, and therefore cannot be used when the tree is in leaf. This difficulty was overcome by the Bordeaux mixture, which is a mixture of bluestone and milk of lime. These two enter into combination and form a double basic sulphate of copper and lime. This compound when exposed to the action of the air is decomposed by carbonic acid and forms carbonate of copper and lime, and liberates free copper sulphate, which coming in contact with the fungus immediately destroys it. The only drawback to Bordeaux mixture has been the high percentage of lime necessary to prevent the copper from burning. This difficulty has been overcome by the preparing of a Bordeaux paste, which is a true basic sulphate of copper, and contains no lime. It is ready for use by simply mixing with water; 4lbs. mixed with 40galls. of water would give a mixture having three times the fungicidal value of 4-4-40 Bordeaux mixture."

Samples were shown of this and other preparations of copper, including a soluble Bur-gundy powder. This is easily soluble in water, and forms a clear, deep-blue solution. It is recommended for use just before picking, as it will not stain the fruit. The grower's time and trouble would be very materially saved by the use of these fungicides, there being no lime present to clog the nozzles of the sprayers.

Lyndoch, May 19.

(Average annual rainfall, 23in.)

PRESENT.—Messrs. Warren (chair), Klauber, Schrader, Woolcock, Burge, A. and E. Springbett (Hon. Sec.).

OLD TIME MEMORIES.—The following interesting letter, written by the late Samuel Springbett to a friend in England nearly 60 years ago, was read by a grandson of the writer:—"I made up my mind not to write to any of my old friends in England until I could see how things were likely to turn out. I am now happy to say that I cannot find fault with the colony since my arrival. On landing we walked to Lyndoch Valley, which is about 37 miles from Adelaide, where we met with a kind reception from Mr. Lawes and Mr. Peter. We had not been with them many days before we took 100 acres of land belonging to the South Australian Company, at 7s. 6d. per acre. We at once began to plough and sow for a crop. We had very little money to start with, but we all set to work in earnest, doing all the work ourselves, ploughing and sowing, reaping and mowing. I am now happy to say that my sons John and Edward and I have purchased 337 acres of land—all in one piece—fenced it all round; and what is better, it is all paid for. We built a stone house on the property last summer and this summer we intend building another. I will now give you some information as to how land is cultivated in this colony. We have very few good farmers here. Most of them are tailors and shoemakers. The system is quite different to England. We commence ploughing and sowing about May, when the rains come. Many people do not sow more than 1bush. of wheat or barley to the acre, but it is not enough, unless upon very good land. You will realise that the land is not very bad when I tell you that the Lawes' had six or seven crops following without any manure whatever. Very few people have barns; they stack the corn and tread it out with bullocks, then burn the straw. We can, with six bullocks, tread out 40bush. or 50bush. a day. Threshing is very expensive in this country. We gave 1s. a bushel last year. Some people have reaping machines which thresh the corn as they cut it. I do not like the plan. They get no straw for manure or anything else. We work here—you will hardly believe it, but I and my three sons reaped more than 40 acres of corn last harvest. We gave £1 per acre and rations for what we had cut. If a person comes to this colony he must make up his mind to work if he wishes to make money. I know a number of very respectable young men who came out here who know nothing about work, they are now hutkeepers for the shepherds. The masters of the shepherds have large flocks of sheep—some have as many as 40,000 or 50,000. I have been told that Mr. Gilbert—who lives at Pewsey Vale, about five miles from us—has 40,000 sheep. He has a beautiful garden, 9 or 10 acres of vines and fruit trees, and makes a great quantity of wine and brandy. From his nursery, last year, Mr. Gilbert sold more than £50 worth of young trees. We have made a garden on the land we purchased and planted a few trees—about 200 vines and 5doz. fruit trees of different sorts. You would be astonished to see how the trees grow in this country. I have seen apple trees make shoots 8ft. in one year. All sorts of trees do well here, such as apple, pear, plum, peaches, nectarines, apricots, and cherries, all out in the open ground. Vegetables of all sorts grow well. Broccoli have been cut that have weighed upwards of 40lbs. We plant vines about 6ft. apart each way and tie them to poles. Before I left England the story was the long drought in the colony and no water to be got. We have sunk a well about 30ft. deep and have a good supply of water, and very good some of the water here is, but some brackish. As for the rain—from the beginning of last May up to September we had a very wet season. That is our sowing time. We have showers, generally, up to December, which is our summer or harvest time. When the hot winds come it is very hot. Our driest and hottest months are January, February, and March; the other nine months are very pleasant. Our nearest market is Gawler Town, about nine miles off, where there are steam mills. We have a township laid out at Lyndoch Valley, and a steam mill almost completed, which is only a mile from us. The millers' charge for grinding is high in this colony—2s. 6d. to 3s. per bushel—and we are obliged to carry it to the mill and bring it home again. Corn is fetching a pretty good price at present. We sold our English barley at 10s. per bushel and wheat at 7s. 9d. (The first corn we sold after we began farming brought, wheat 3s. and barley 2s. 6d. per bushel). This is in consequence of the gold discovery of which, no doubt, you have seen in the newspapers of your own country. Some people have made a good deal of money by going to the goldfields. All my sons have had a trip to Melbourne. They did not get rich, but got about £100 each. Everything has risen in price since the gold diggings started. When we came to the colony bullocks were worth £8 to £10 a pair, now they are worth £20. We have 12 working bullocks. Labor is very dear at present. We cannot get a boy of 9 or 10 years of age to drive a plough under 6s. a week and his rations, laborers 25s. to 30s. a week and rations. So

you see the advantage of people doing their own work. . . . Please give my respects to Mr. —— and tell him that 'the old fool' as he called me is well and happy and has now more acres of land of his own than he would have had had he remained in Chiltern 100 years. Tell Mr. —— that I have many times repented since I have been here, but it is because I did not come out before."

Mount Pleasant, May 13.

(Average annual rainfall, 27in.)

PRESENT.—Messrs. Giles (chair), Royal, Millar, Godfree, Tapscott, Phillis, Fulwood, Adams, Vigor, and Maxwell (Hon Sec.).

FARMING.—Mr. D. C. Maxwell read a paper on farming in this district, of which the following is a full abstract:—"In farming, one of the main things is the cultivation of the soil, and for our district the old double-furrow plough, with three good horses, is the best for breaking it up. I should commence ploughing as soon as possible after the first rain, in April or May, ploughing 5in. deep, and then leave it for a week or two. One thing that is against putting off drilling too long is the risk of the land getting too wet and boggy. I would, however, rather wait a month or two than drill directly after ploughing, as it makes a far better seed-bed. The last two years, the best crops that we had were grown on lands ploughed before the middle of June, and sown in July, and in the meantime a great deal of rain had fallen on it each year. If the ground is not very stiff and well set, I think one time over it with the harrows before drilling is enough: if it is stiff, harrow it twice; always harrow after drilling, as if it is not harrowed the birds and mice follow up the rows, and do a lot of damage. I would roll all ground intended to be cut for hay, and if the ground is in nice order, roll it all. For a strong grown, heavy crop, use the binder: but if the crop is short and the ground at all rough, I should use the clipper, and feed the hay to stock without being chaffed. I think the stripper is more suitable than the harvester in this district for reaping: for one thing, the ground is too hilly as a rule for the harvester; another thing, there is too much chaff wasted. I think that Federation is the best kind of wheat for this district for grain, and experience has led me to believe that if the grain is not injured much it is best to sow rather thinly, about 50lbs. an acre being sufficient. Other kinds of wheat require sowing thicker, a bushel an acre, or even more. Dart's Imperial is a good all-round wheat, being suitable for hay or grain. If the ground sown is intended to be cut for hay, sow about 30lbs. wheat, and 40lbs. oats to the acre, Calcutta oats for preference. There are several kinds of wheat which I think about equal for hay, namely, Dart's Imperial, Gallant, Tuscan, Majestic, Huguenot, &c. I do not like bearded wheat for hay. A very important thing if farming is to be successful is the improvement of the soil. Artificial manures have come to be recognised as something that cannot be done without, and for a general thing I think superphosphate best where the rainfall is not too great, but it is not much good for very wet parts. Bonedust is undoubtedly best in the long run, but I think it is advisable to put some more quickly soluble manure with it. We generally put about 80lbs. to 1cwt. to the acre, but it might pay to put double that quantity on. Although we must have artificial manure, I think every farmer ought to make as much farm-yard manure as possible. Take in a good stack of straw, and keep plenty of bedding for horses, cattle, and pigs; and as winter is the time that most manure can be made, it is best to put it straight on to the land, and plough it in; then the ground gets the benefit of every bit of good there is in it. I have heard people say that new manure is too heating, and the crop is liable to blight after it, but there is not much fear of that in this district if the manure is not put on too thickly. On the Murray Flats we always spread out our manure in July, August, and September, and fallow it in, and it seems to do well. Any weeds that may be in the manure have a chance to spring before the next season. Another thing that helps to improve the land is keeping and feeding stock; not overstocking by any means, as that makes the land worse. If every farmer would grow feed, say, for cattle and feed it to them it would help the land. I do not think many parts of this district are very suitable for summer crops, but what I favor is to grow wheat, oats, and barley, cut a good lot of hay, and save all cocky chaff. I believe that the making of ensilage for milking cows is a good thing. We ought to have stables for our cattle, and attend to them as well as we do our horses; the time is coming when it will pay us to do so either for milking cows or for fattening cattle. Pigs are a great help towards improving the land on which they run. It is a mistake to keep all pigs shut in sties, especially brood sows; if they are allowed to run in a paddock they will keep healthier, breed more regularly and have better litters. If pig paddocks are made a fair size, and plenty of green feed growing in them, a very inexpensive fence will keep them in; posts 3ft. 4in. high and 9ft.

apart, with five or six barb wires, is quite good enough. Every farmer ought to keep both sheep and fowls: a few sheep help to keep down expenses in the way of butcher's meat, and fowls in almost every case turn in something more than the expense of keeping them. I would like to say a little about experiments. I think it is a good plan for every farmer to try some experiments with things which he thinks will be likely to benefit himself or others; but do not try too many unless you are sure that you can afford it. The country is in a better position to-day than it could have been if lots of experiments had not been tried; but I have observed that it is not always the man who makes the experiment who gets the benefit of it. I should like to see men who have done well at farming, and are able to retire, go in for experimenting, and find out what will do best in their district. It would be a fine thing for the district, and a good thing for the men themselves, as it would make life a good bit more interesting. I would like very much to see a Government Experimental Farm in the hills, but until we get it some of our rich men might do a lot of good by carrying out experiments. I remember a good many years ago Mr. Giles had a plough fixed up to do subsoiling as well as ploughing—a thing that I seem to think ought to do splendidly in this district. As we never hear of it being worked now, I take it for granted that it did not prove to be any advantage over ordinary ploughing, perhaps on account of the subsoil being too loose. Now, my idea is to have a subsoiler, and then a subpacker to follow it, for the growing of summer crops. I cannot help thinking that our district is suitable for the growing of summer crops if we knew just how to grow them. We have tried over and over again, but only very rarely has the returns paid for the work and expense. When one sees the way that stinkwort will grow, even in the hottest summer, it makes one think that some more useful fodder could be grown very advantageously if we only knew how. In regard to rotation of crops on the farm, I think a good plan, if one has a certain quantity of ground suitable for cropping, is to have it divided into six paddocks of fairly equal size; and we shall take, say, one paddock for example. I should plough it very deep, and sow wheat, or wheat and oats mixed, the first year; the second year plough shallower, and sow oats on part, and barley on the rest; then leave it to grass for four years. I find that it grows more grass after oats and barley than after wheat, and I do not think the two crops running makes it any worse for grass." A good discussion followed the paper. Mr. Giles agreed that every farmer should carry out some experiments: they ought, he thought, to give more attention to the growing of mangolds. Members generally would let the ground lay for some little while after ploughing, provided there was no danger of it getting too wet.

Port Elliot, April 17.

(Average annual rainfall, 20½ in.)

PRESENT.—Messrs. Welch (chair), Vince, Green, Brown, Gosden, and Hargreaves (Hon. Sec.).

PREPARING SOIL FOR SEEDING.—Discussion on this subject took place. Some members thought it unadvisable to plough the soil more than once a season in this district where there was a good rainfall. Mr. Vince had always obtained the best results from one ploughing. To level the soil Mr. Green used four half-round posts, one behind another, each being parallel to the one in front, and fixed at the ends with chains. A similar contrivance, but with two posts, was employed by Mr. Vince, who hitched it up behind the harrows.

HAY AND GREEN FODDER.—Most members of this branch favored oatmeal hay for horses which had quick work to do, but some preferred mixed oatmeal and wheaten. For green fodder Mr. Hargreaves recommended Cape Barley and others, King's Early wheat, or oats.

BIRD PESTS.—This branch considered that concerted action should be taken to destroy sparrows, starlings, goldfinches, rosella parrots, and magpies. If they were allowed to increase in the next few years as they did in the past few it would not be possible to grow any kind of soft fruit in this district.

MANURES FOR CEREALS.—Arising out of the Roseworthy College harvest report a discussion as to the best quantity of manure to apply to the soil for cereal crops took place. It was considered that from 70 lbs. to 112 lbs. per acre, according to the nature of the soil, was the right quantity. Mr. Gosden reaped better yields from crops grown with 70 lbs. of super. at Towitta than from those grown with 224 lbs. in the hills near Port Elliot.

GRASSES.—Mr. Gosden reported that he had had very good success in growing paspalum and rye grass in the hills. Mr. Hargreaves had the best results with paspalum and Yorkshire fog.

Port Elliot, May 21.

(Average annual rainfall, 20½ in.)

PRESENT.—Messrs. H. B. Welch (chair), H. Welch, Green, sen., Chibnall, Barton, Pannell, and Hargreaves (Hon. Sec.).

MANURES.—Mr. Welch recommended guano for peas. For wheat super. gave the best results. It was better than sheep manure, which seemed too hot and caused the crop to blight off. With Marshall's No. 3 wheat and 50lbs. super. he reaped 35bush. of wheat per acre. With 112lbs. super. the yield was 40bush. per acre, while the unmanured crop returned 30bush. per acre.

WHEATS FOR DISTRICT.—Federation was thought to be a good milling wheat. Marshall's No. 3 a big yielder; King's Early was recommended for greenfeed, and Tuscan for hay. Dart's Imperial was considered a good wheat but for its liability to rust.

PICKLING SEED WHEAT.—Members considered that bluestone was the best pickle to use, at the rate of 4lb. to each bag of wheat. It was thought that the seed should be drilled in as soon as possible after pickling, as if allowed to remain the bluestone seemed to affect the germination somewhat.

Strathalbyn, April 25.

PRESENT.—Messrs. Fischer (chair), Allison, Gardner, Collett, Moore, Nicholls, Heinjus, W. and J. R. Rankine (Hon. Sec.), and five visitors.

RAILWAY FACILITIES.—A special object in this meeting was to consider the best way in which to bring under the notice of the railway authorities the need for better accommodation for loading and unloading goods at the local station. The question was discussed by those interested in trucking wheat, wood, and other goods, and a public meeting was convened for a later date.

COMPETITION WHEATS.—Mr. W. Rankine's report of the competition wheats grown by him for the Department was read. The four varieties to be tested in the southern district were sown in two-acre plots on May 18th and 19th—1bush. of seed per acre and 1ewt. manure. Comeback was stripped on December 13th, and yielded 26bush. 36lb. per acre; this was a thick and high crop, but shelled somewhat. White Gamma, stripped December 24th; very nice even crop; yield, 29bush. 35lb. per acre. Red Gamma, stripped December 25th; the best crop of all; very even and thrashed well; yield, 33bush. per acre. W.A. Crossbred 53, stripped December 29th; this was a very different class of wheat from the others; it was up before the two preceding varieties, but was the last to come to ear; a creepy wheat, but stooled well; not difficult to thrash, but there was more than the ordinary quantity of chaff; in patches the crop was 5ft. 6in. high, it did not shake out, and the yield was 27bush. 37lb. to the acre. A plot of Bunyip, a local wheat grown alongside as a test, was stripped on December 10th, the yield being 27bush. 45lb. per acre. This plot was very early—the last sown and the first stripped.

Uraidla and Summertown, May 2.

(Average annual rainfall, 42½ in.)

PRESENT.—Messrs. Collins (chair), Kessell, Willsmore, Hawke, Richardson, Hart, Johnson, G. F. and H. F. Prentice, Rowe, Hoffman, and Snell (Hon. Sec.).

TURNIP-GROWING.—Mr. Kessell read a paper on turnip-growing, and after speaking of the origin of the plant, proceeded as follows:—"The food value of turnips is low. They contain 90 per cent. of water. The solid constituents are nearly 2 per cent. of albuminoids, 3 per cent. sugar, between 2 per cent. and 3 per cent. carbo-hydrates, only a slight trace of fats, and no starch at all. Nevertheless, turnips are of great value and have revolutionised methods of cropping, rendering the modern system of rotation possible. The crop is quick-growing, cleansing, hardy, and, to a certain extent, restorative. Turnips do not require such a heavy dressing of manure as swedes, but the land must be in good heart to produce big crops. Commercial fertilisers are of much value, as they enable the plant to be forced quickly out of the seed-leaf stage, but the use of these manures must not be overdone. The cultivation necessary depends largely upon the nature of the soil. Good crops can usually be grown on heavy soil, but all seed beds should be thoroughly pulverised, so that the plants can get a good strong start. Experience must be the guide as to the distance in the drills and the thinning. The after work is done best with the

hoe, and it is absolutely necessary that all weeds be destroyed. Applications of lime are very useful to keep down pests, and usually improves the soil; but salt should not be applied. The disease known as finger and toe is said to be caused by a fungus. Nevertheless, the selection of seed and methods of cultivation have an influence on this trouble. If the disease should appear, the land should be freely treated with lime and soot, and no crop allied to the cabbage or turnip should be grown on the plot for three years. Every affected stalk or root should be destroyed by fire.

INFERIOR CHAFF.—Members called attention to the inferior chaff being sold in Adelaide. Some of this was considered to be injurious to stock, and members thought its sale should be prevented.

Willunga, May 7.

(Average annual rainfall, 25½ in.)

PRESENT.—Messrs. Pengilly (chair), Binney, Allen, Burton, Waye, Bigg, and Hughes (Hon. Sec.).

CURCULIO BEETLE.—The Chairman reported that a large number of his young fruit trees had died as a result of the bark being stripped from the twigs by some insect or grub. It was suggested that it was curculio beetle, and spraying was advised, or, as another remedy, to fix circular pieces of tin, made saucer-shaped, around the stems of the trees.

POTATOES.—A discussion took place on potato-growing. Bismarcks were the heaviest croppers in this district, but suffered from blight more than other varieties last year. Mr. Bigg mentioned that a few years ago on a piece of new swampy ground he grew a marvellous crop of Snowflakes; the tops were unusually tall and rank; the yield worked out at over 30 tons to the acre. In a good many cases the tubers had to be put end-ways into a kerosine bucket, and weighed 2 lbs. to 3 lbs. each. In spite of the enormous yield the quality was excellent.

STRAWBERRIES.—Mr. Bigg tabled some fine strawberries, the result of the heavy rains early in March.

SOUTH-EAST DISTRICT.

Frances, April 22.

PRESENT.—Messrs. Carracher (chair), F. A., and Geo. Holmes, Baldock, Tompkins, and Feineler (Hon. Sec.).

POULTRY.—A paper on poultry was read by Mr. F. A. Holmes. “It is acknowledged that South Australia is an ideal country for the production of high-class poultry. The wonderful development of the past few years has proved that no other portion of the world is more favored in this respect; but although great strides have been made the industry is still in its infancy in this State. The safest way for the beginner to start is on a small scale, either by purchasing a setting or more of eggs and getting broody hens to hatch them, or by buying a few hens and a cockerel from a reliable breeder. Both ways have their advantages, but I would recommend the former. By getting several settings of eggs and rearing the chicks you are gaining experience all the time they are growing, and experience is the only thing that can ensure success. If you start by purchasing grown-up fowls, I would advise buying about half a dozen two-year-old hens and a cockerel from a reliable breeder. You will get hens that age much cheaper than if they are a year younger, and besides you can reckon that they are fairly good if he keeps them two seasons. Do not be afraid to buy a cockerel from the same breeder if he is a reliable man; and if you do not think he is a reliable do not have anything to do with him. A cockerel is better if bred from the same strain, provided it is not too closely related. You can take great liberties in mating poultry as long as you know they are and have been perfectly healthy, and are strong in constitution. Cockerels mated with two-year-old hens will give a larger percentage of pullets—a great consideration—and the progeny is generally stronger and more robust than if they are bred from pullets. Secure the best you can, do not buy cheap, worthless stuff. I would impress on you to go slow at the commencement, gain your experience as you go along, and do not invest

much capital until you have gained enough experience to warrant it. Plenty of patience and perseverance is required, as you may have many things to discourage you. On starting out in the poultry industry we have to decide what the objective will be, though I hardly think it necessary to dwell on this as all of us will be after eggs as the source of production. This is the one of most importance to build up a paying business. Right away select the very best stock from proved good laying strains. Anyone can have eggs in spring and summer time, but to get winter eggs is much different. If you wish to get eggs when they are at a high price you must hatch the chick at the right time, which will be about September. Then you have them starting to lay in March. Do not hatch anything out after November, as you will only be disappointed. The chicks as a rule are wasters, and generally speaking they are nothing but breeding grounds for vermin and disseminators of diseases in various forms. I admit it is difficult to get many broody hens so early as that, and so one would need to use an incubator to hatch many at the required time. For eggs alone the Mediterranean breeds are best, and the White Leghorn stands out from all the others. We have only to take the Government laying competitions in support of this. Many people have an objection to them because they fly on haystacks, into gardens, and everywhere they are not wanted; but I think this is because they are hungry. My experience is that if they get enough to eat they are very little more trouble than the heavier breeds. If you wish a dual-purpose breed, then you must take the prettily-marked Silver Wyandottes or the massive Black Orpingtons: both of these breeds, besides being good table birds are proved good layers. I would like to emphasize the fact that there are White Leghorns, Silver Wyandottes, and Black Orpingtons which are no better than any other breeds, and it is not so much a matter of breed: the question of strain is most important, and the crux of the situation. When you have a small flock built up from a noted strain, always keep your eyes open for the lively, busy hen. Those with a fine narrow head, bold prominent eye, smooth face, and, unlike the old proverb, late to bed and early to rise, these are the ones to keep and breed from. Cull out those which do not come near this standard and sell them early. It is the accepted rule not to keep hens over two years unless they are specially good. Generally speaking a hen after she is two years old does not lay more than enough to pay for her feed. Of course this does not apply to your breeding stock, as you can breed from them up to four years old. Do not keep more cockerels than you require; two or three are quite sufficient to fertilise all the eggs an ordinary farmer would want to hatch out in one season. It is recognised by all those who have made it a study that the pure-bred fowls are the best. You will hear many people say that they have mongrel-bred fowls which lay as well as any pure-bred ones. This is a mistaken idea altogether, as has been proved repeatedly in open competition. Most of us who have gone in for poultry-keeping on a small scale have to be content with the locality in which we are situated, but to those who are starting out in the business proper I would say, choose the best situation available on which to erect your pens for breeding purposes. Select a place where there is a good slope, the ground dry, and the soil of a porous nature. Wet ground, which consequently means wet feet, is very injurious to fowls, and especially laying hens. You will want two or three breeding pens, each about 10ft. wide and 40ft. to 50ft. long. This will be large enough for seven to ten hens. They can be made more cheaply if you put a fairly strong netting 3ft. high, and then a cheap large mesh 3ft. on the top of this. The houses should face the morning sun, open in front about 4ft. 6in. to 5ft. high, perches about 18in. from the ground. Shade, too, is a necessity in summer. Artificial shade is provided at the Roseworthy competitions by erecting small shelters with bagging. Feeding is all important, as it does not matter how good a laying strain you have if they are not properly fed. The old saying, 'Half the breed goes down the throat,' fully applies here. Many make the mistake of only giving enough food to keep fowls in fair condition, and not a little over to manufacture eggs. The feeding practised at Roseworthy, and described in the May issue of the *Journal*, can hardly be improved upon. Of course, this can be altered slightly; for instance, any kind of meat will do instead of meat meal. The much despised rabbit makes an excellent substitute, and for green feed almost any refuse from the garden, such as cabbage, lettuce, and turnip leaves and so forth. Plenty of scratching litter in the pens is first class to give them exercise to keep up bodily heat to promote laying. When penned up you must also supply them with a set of teeth in the shape of something to grind their food with. Broken china or glass is one of the best, but when you have to provide for a large number it is better to get sharp flint grit, which can be obtained very cheaply, as also can shell-forming substances, which must be provided. There are various tonics which are beneficial in summer time, such as Epsom salts (one packet to 25 fowls), and Douglas mixture, which is easy and cheap to make. Water should be pure and wholesome, and

should never be left standing in the sun to get hot, as it is likely to cause bowel trouble. I always keep some permanganate of potash, putting a small quantity in a whisky bottle of water to make a stock solution, and when about to take water to the pens, just put a little in the bucket of water to give it a slightly pinkish tinge. This is quite harmless, and an excellent preventive against disease spreading by the water being contaminated. It is always wise to guard against any developments of this kind. In winter time, when setting a hen, make the nest in a box, but in spring scoop out a hollow in the ground, put a little soft straw, or, better still, dry grass. I always have them in a small house so that other fowls cannot disturb them, and so that they cannot get away the first time or two they come off the nest. Having thus prepared for 'biddy' to put in her 21 days of solitary, I go at night and remove her from where she went broody, put her on the prepared nest with dummy eggs, cover the nest over with a bag until the second night after, and just before dark on that second night, I remove the bag and let her come off to feed and drink, and she will almost invariably return to the nest. When I find her taking kindly to her new quarters I let her come off to feed, and then change good eggs with the dummies, and rarely have any trouble with them. I find it better to always keep them covered, letting them come off every evening for feed and water. Insect powder should be sprinkled on them occasionally, for when they are setting vermin breeds very quickly. I usually set two hens at a time so that if the eggs are not all fertile you can put them under the one hen; also if the hatches are not very large, let one hen mother the lot. When the chicks are hatched they should be left from 36 hours to 48 hours without feeding. Oatmeal, breadcrumbs, or prepared chicken meal is the best in the early stages, the first for preference. Be careful not to give sloppy foods, as it will cause bowel trouble. If they get wrong with this, give a little ground charcoal in their food. In about three weeks cracked wheat can be given, and at five whole wheat if you like." [The writer then referred to artificial incubation, diseases, the results of the egg-laying competition at Roseworthy, and the magnitude of the poultry industry of America, for which we cannot find space.—ED.]

Kybybolite, May 19.

(Average annual rainfall, 22in.)

PRESENT.—MESSRS. BRADLEY (chair), G. H. AND W. HAHN, PETTIT, SMITH, KUHNE, LLOYD, SCOTT (HON. SEC.), AND ONE VISITOR.

PICKLING SEED WHEAT.—THE HON. SECRETARY READ A PAPER ON THIS SUBJECT FROM PAGE 861 OF THE MAY ISSUE, AND DISCUSSION FOLLOWED. MR. BRADLEY CONSIDERED THAT A 1 PER CENT. SOLUTION OF BLUESTONE WAS NOT STRONG ENOUGH FOR THIS DISTRICT, AND HE THEREFORE USED A 2 PER CENT. SOLUTION. HE ADVOCATED PICKLING ON A FLOOR MADE OF WELL-RAMMED EARTH AFTERWARDS TAR-DRESSED. IT WAS MADE SLIGHTLY CONCAVE, AND WAS THE CHEAPEST FLOOR TO PREPARE IN THIS DISTRICT. MR. HAHN ALWAYS USED A 1 PER CENT. SOLUTION AND HAD VERY LITTLE TROUBLE FROM SMUT. HE THOUGHT THE WEAKER SOLUTION BETTER, AS IT SEEMED STRONG ENOUGH TO DESTROY THE SPORSES AND WAS NOT SO DEDIMENTIAL TO THE GERMINATION OF THE GRAIN AS A STRONG SOLUTION. ALTHOUGH HE DIPPED HIS SEED, HE BELIEVED THAT IT WAS BETTER TO PICKLE ON THE FLOOR. MR. LLOYD SAID THAT ON YORKE PENINSULA HE USED A 2 PER CENT. SOLUTION, ALLOWING 10GALLS. OF WATER TO FOUR BAGS OF WHEAT. THEY KEPT ON TURNING THE GRAIN ON THE FLOOR UNTIL ALL THE LIQUID WAS ABSORBED. THE GRAIN WAS THEN DRIED WITH TWO SHOVELFULS OF QUICKLIME TO THE BAG. THIS ALSO SEEMED TO CHECK TAKEALL. IN ANSWER TO A QUESTION AS TO WHY SEED SOWN IN DRY SOIL WITHOUT BEING PICKLED SHOWED VERY LITTLE SMUT, THE HON. SECRETARY THOUGHT THAT THE WHEAT GERMINATED AT A HIGHER TEMPERATURE THAN THE SMUT SPORSES, AND BECAME TOO HARD FOR THEM AFTERWARDS TO ATTACK. MR. HAHN THOUGHT THE SMUT SPORSES GERMINATED FIRST AND THEN PERISHED. [SMUT SPORSES WILL GERMINATE WITH CONSIDERABLY LESS MOISTURE THAN WHEAT, AND WHEN SEED IS SOWN IN WHAT IS CALLED DRY SOIL THERE WILL, IN MOST CASES, BE SUFFICIENT MOISTURE TO START THE SPORSES. IF THE WHEAT DOES NOT GERMINATE WITHIN A SHORT TIME THE SMUT FUNGUS MUST PERISH.—ED.]

THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE

OF THE

26 APR 1911

Department of Agriculture OF SOUTH AUSTRALIA.

No. 12.

JULY, 1910.

VOL. XIII.

Published Monthly by the Department of Agriculture.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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J. P. WILSON,

Minister of Agriculture.

POINTS FOR PRODUCERS.

The Weather in June.

Mr. E. Bromley, the divisional officer of the Meteorological Department, notes that—"The weather during June has been, on the whole, mild; many days, especially during the latter part, were very pleasant, and some almost springlike in character. These conditions, coupled with the fact that splendid rains were recorded over the Northern Areas, have further advanced the prospects of another good season. The high-pressure system was displaced on the 7th by a southern disturbance, which, in conjunction with monsoonal influences, brought splendid rains over the northern pastoral country and the upper northern agricultural areas, and also heavy falls in the South-East, but elsewhere the amounts were only light to moderate. On the 13th high-pressure conditions rapidly became established over Australia, and temporarily fine and frosty weather resulted. Monsoonal influences, however, again developed, and rain set in over the far north and north-eastern pastoral country. Another disturbance which moved over the State on the 20th, brought the best rain for the month. Every telegraph station, with the exception of those on the extreme west coast, received a splendid downpour; 80 stations recorded over 1in., and several over 2in. The maximum fall was 2·95in. at Port Pirie. During the remainder of the month low-pressure waves passed along the ocean in rapid succession, bringing unsettled conditions, with heavy showers and thunderstorms, interspersed, however, with intervals of temporarily fine, mild, and pleasant weather."

Searing of Lambs.

"By the system of searing," says John Wrighton in the *Agricultural Journal* (London), "we seldom lose a lamb. In all respects searing is better than 'drawing,' as it prevents all bleeding and entails less suffering. I was accustomed to drawing in my earlier farming years. It was always done when the lambs were only a few days old, and briefly consisted in holding the unfortunate animal firmly by its four legs held together in pairs, the parts being thus exposed to the operator. The top of the scrotum was amputated, and the drawing was effected by the teeth, the 'cords' being tightly held by fingers of both hands. This must have entailed much unnecessary pain, which is to a great degree prevented by the clamp and the searing-iron. The lamb is seated on a bench, and the necessary amputation, and exposure of the testes is first rapidly performed. The testes are drawn

out, the clamp applied, and the severance effected by the searing-iron. The 'cords' are returned, and an emollient is used to soothe the parts, and the lamb is liberated. There is little swelling when the operation is skilfully performed, and the lamb soon seems to forget it."

Intensive Cultivation.

In Asia, where the records of the oldest civilisation are found, the survival of the fittest has compelled intensive cultivation. The island kingdom of Japan has but 21,321 square miles of cultivated land to support a population approximating 50,000,000 inhabitants. This is an average of 2,277 people to the square mile. The land also supports 2,600,000 head of cattle and horses. This would average no less than 142 people and seven cattle and horses for every 40 acres. Such congested population compels intensive land cultivation for mere maintenance.

British Dairyfarmers' Show.

The thirty-fifth annual show of the British Dairyfarmers' Association will be held in the Royal Agricultural Hall, London, on October 4th to 7th, inclusive. Entry forms have come to hand from the Acting Trade Commissioner in London, and special provision is made for colonial butter as follows:—Class A.—Salt butter, one box, containing not less than 56lbs. (entry fee, 10s.).—First prize, silver medal and £5; second prize, bronze medal and £3; third prize, £2. Class B.—Fresh butter, one box, containing not less than 56lbs. (entry fee, 10s.).—First prize, silver medal and £5; second prize, bronze medal and £3; third prize, £2. As entries close in London on September 5th, or with an additional fee of 50 per cent. at noon on September 10th, they should be dispatched not later than August 1st. Entry forms have been distributed to the various factories, and the manager of the Government Produce Department will attend to all shipping and staging arrangements on their behalf. Butter for this show should be packed in good, well-made plain boxes, carefully wrapped in bagging, before being forwarded to the works, Port Adelaide. The maker's name and a notification as to the class for which the butter is intended should be legibly branded on the outer covering. The butter must be delivered at the show in London by October 3rd, which means that exhibits must be in the depot, Port Adelaide, by the first week in August at the latest. This show is an excellent medium for advertising the dairying industry of the State. Several South Australian factories have received first and other prizes in former years.

POINTS FOR PRODUCERS.

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The Cork Industry.

It has often been urged that Australia, which produces such excellent wines, should also grow the corks for stoppering the wine bottles. The climate which suits the vine will also in most cases suit the cork tree. Mr. F. de Castella (the Government Viticulturist of Victoria) has recorded, in the June number of the *Journal of Agriculture* of that State, the result of his inquiries into the cork industry in Portugal. The cork oak is grown commercially in that country, in Spain, and in parts of southern France. The annual production in Portugal is 50,000 tons of dry cork, valued at £813,290, and the yield amounts on an average to over 30s. per acre yearly, exclusive of the value of the acorns for pig feed. The plantations usually occupy land too poor for ordinary agriculture, and even too poor for vines, and usually no labor is bestowed on the trees except for the removal of the bark. The reason why the industry has never been established here or in Victoria is doubtless the long period of waiting required. The first stripping for the removal of "virgin cork" takes place between the fifteenth and twentieth year of growth. This is necessary to allow for the expansion of the trunk and larger branches, and the first important stripping from a commercial point of view occurs eight or ten years later. After this the bark is removed regularly at intervals of nine or ten years. Skill and great care are required to avoid damaging the tree. The sheets of bark are taken to the factory, graded, boiled, and reduced to the flat condition known in the trade as "cork wood." A few fine cork trees have been grown in various parts of Victoria and South Australia, so that there is no doubt of the suitability of the climate. "The industry," says Mr. de Castella, "belongs to the domain of forestry rather than to that of agriculture or horticulture. The production may be considered almost indefinite, since the life of the tree, in spite of the regular removals of cork, is generally set down at over a couple of hundred years. Nor does there appear to be any danger of over-production; the world's consumption of cork is increasing more rapidly than the supply, and good cork is becoming steadily scarcer. As a means of turning poor soils to more profitable account and at the same time providing an excellent evergreen shelter tree, few others can compete with it."

Rare Profits from Sows.

Prolificacy of production is a most desirable quality in all utility stock, and as this trait is largely hereditary it is from highly productive stock that breeding animals should be chosen. As an instance of this principle of hereditary fecundity in pigs the following facts are related:—Mr. J. Williams, Warburton Road, Seville, has a breeding sow, a grade Berkshire, which farrowed 101 pigs within four years and reared 91 of them. A young sow

was purchased from him by Mr. John Smith, Avon, East Warburton. This sow had her first litter of eight pigs on September 10th, 1908. These, when fit, were sold as baconers for £20 0s. 1d. Concentrated food, such as bran, pollard, and biscuit refuse, was purchased for them to the value of £6 6s. 9d., and on this was also fattened a 260lb. pig that was killed and cured on the farm. A second litter of 10 was farrowed on April 25th, 1909. Nine of these were sold for £18 9s. 6d., and one weighing 121lbs. was killed for home use. Feed to the further cost of £6 6s. was used in growing these. The sow had a third litter of 15 on August 28th. Of these 10 were well-grown when seen on February 3rd, 1910, and two had been sold for £3 9s. 2d. This sow, therefore, farrowed 30 strong pigs within 12 months, 17 of which were sold at a profit of £23 9s. 2d. Besides this, she paid for the raising of the household supply of 380lbs. of pork and bacon, and her second year's work begins with 12 young ones to sell, against eight of the previous year. With such breeding stock as this, and reasonable care, pigs can be made a very profitable side issue on the dairy farm.—*Journal of Agriculture of Victoria.*

Insecticide Device for Cattle.

A Nebraska inventor, *The Scientific American* reports, has carried the automatic idea to the extent of enabling live stock themselves to apply insecticide or soothing oil to parts that are irritated or affected by vermin. The invention consists of a rubbing post in which is a reservoir filled with the insecticide, and which may be placed at any suitable place convenient to the live stock. The rubbing post is formed with a central reservoir, in which the oil is kept. Between this and the outer casing of the post is a felt-like filling. A wick serves to carry the oil from the reservoir to this filling. The outer casing of the post is perforated, so that when the animal rubs against it the oil will exude from the perforations and be spread upon the affected part.

Registration of Stallions.

Throughout a number of the American States stringent legislation is in operation to protect the horse-breeding industry. Wisconsin was one of the first to legislate to provide for the registration and examination of stallions, and the breeder who uses an unsound or mongrel stallion has to thank his carelessness alone for any unsatisfactory results. No stallion is allowed to be used for service until registered by the authorities, and every stallion must be certified as sound by a veterinary, or the owner must swear an affidavit before it can be registered. The certificate of registration describes the stallion as "pure-bred," "grade" (that is one parent was a pure-bred), "cross-bred," or

"mongrel or scrub" as the case may be, and every bill or poster issued by the owner must contain a copy of this certificate in bold type, and the name of the stallion must be preceded by his classification—This "pure-bred," "grade," "mongrel," &c. Further, the owner must post up at the stables where the horse is kept similar notices. The person who utilises the service of a horse officially described as "mongrel" must have curious ideas on stock-breeding, yet the Wisconsin authorities in 1909 registered 22 "mongrel" stallions. The effect of these laws, which have been in operation since January, 1906, is now being shown, it having taken some years to educate breeders up to the purport of the law. On September 18th, 1909, there were 1,319 licences for pure-bred stallions in operation, and 1,836 for stallions not pure-bred. In 1906 only 35 per cent. of the stallions registered were pure-bred, while in 1909 the percentage had risen to 42.

Gluyas Wheat in South Africa.

The Cape Agricultural Department some three years back introduced seed of several rust-resisting wheats from South Australia. Of these Gluyas has given by far the most satisfactory results, and the May, 1910, official reports on experiments contain the following:—"The 1908 reports show that Gluyas wheat is one of the best of recent introductions, and its virtues include quality, yield, and rust-resistance. In 1909, although it is still rapidly gaining in favor and many of the reports are of a very flattering nature and eulogise its rust-resisting and yielding properties, a good many report rust, which, however, in nearly every case can be traced to late sowing, and it is also possible that the seed may not be true in all cases." Gluyas wheat has also given very good results in the Transvaal and British East Africa, but the report quoted above suggests that the change of environment is beginning to affect its powers of rust-resistance. It is probable that unless the work of selection is continued in South Africa this wheat will gradually lose its special character of resistance to rust. The effect of change of climate in this respect is shown by the susceptibility of the Durum wheats to rust in South Africa. These wheats were imported on account of their freedom from rust in other countries, but have proved a complete failure at the Cape.

The Food of Birds.

The Journal of the Board of Agriculture (England) for May contains a summary of investigations into the feeding habits of the rook which is of interest. It is generally supposed that the food of the rook consists very largely of beetles, insect larvæ, and earthworms, but the bulk of the food found in the gizzards of 631 birds which were examined consisted of grain. The investi-

gation was undertaken by Mr. W. E. Collinge, M.Sc., and specimens were as far as possible obtained each month from every county in England and Wales. Mr. Collinge was astonished at the small proportion of animal food found in the gizzards. For the 12 months it averaged only 15 per cent. of the total food contents. In addition to the specimens obtained in 1909, the results of 58 specimens previously examined and 141 specimens examined by Mr. D. T. Thring in 1908 are tabulated. This shows that of the food contents of these 830 birds 67.5 per cent. consisted of grain; 3.5 per cent. of seeds, fruits, and other vegetable substances; 15 per cent. of wireworms and other insects; 10.5 per cent. of earthworms; and 3.5 per cent. of miscellaneous food. Similar investigations in this State into the feeding habits of the sparrow; starling, blackbird, &c., would be of considerable value.

Sodium Cyanide for Fumigation of Trees.

Professor Woglum, of the Californian Department of Agriculture, reports on experiments in respect to the use of sodium cyanide instead of potassium cyanide in the fumigation of trees. In view of his definite statement as to its safety, efficacy, and cheapness, the question is one of great interest to our citrus-growers. He says—"Potassium cyanide, when absolutely pure, produces 100 per cent. gas. Sodium cyanide of equal purity will produce 133 per cent. gas, or one-third more than the potassium. Results obtained by use of sodium have proven just as satisfactory as potassium in the killing power on the different scales. The cost of the best sodium is 3 cents to 4 cents a pound more than potassium. The sodium produces at least 25 per cent. more gas, saving thereby from 6 cents to 7 cents on each pound. It is therefore readily noticeable that its use will save considerable money. Should its use become general the price would naturally decrease, coming as low as potassium, and, in time, entirely supplanting that chemical agent. In the purchase of cyanide it always pays to get the best—some which does not contain salt. As soon as salt creeps into the cyanide it means a great loss of gas."

Agricultural Education in Japan.

In an interesting article on Agriculture in Japan in the *Detroit Free Press* Mr. Frank G. Carpenter reviews the situation of agriculture in that country, and among other things refers to the steps which are being taken to educate the farmers there. "The farmers of Japan," he tells us, "are rapidly changing. There are public schools everywhere, and the boys and girls of the country communities attend them. Nearly every man can read and write, and

most of the landholders know what is going on as to scientific cultivation. The Government is doing a great deal along the lines of agricultural education. It has big agricultural colleges at Tokyo and Saproro; and there are thirty-six smaller colleges which are teaching theoretical and practical farming in the towns and prefectures. There are special colleges at Kyoto devoted to the art of silk culture, and instruction is also given in tea-raising and in the other specialities of Japan. The Government has 310 travelling lecturers, who go from town to town and from district to district preaching advanced agriculture to the farmers, and instructing them as to insects, fertilisers, and various crops. Some of these men are present at every agricultural show, and attend also to the experimental farming carried on at the public expense. Japan has now more than 200 experiment stations, and there are other experiment stations established by the farmers themselves. The first of these stations were organised by men from our Agricultural Department, and there have been many American professors in the colleges. Among the experiment stations is one for the study of the tea plant and of all modes of curing the leaves and preparing them for the market. There is also an imperial silk farm and an imperial cattle and horse breeding establishments."

Dry Farming.

"The most fatal error in modern farming," says Dr. Wm. Macdonald Dry Land Agronomist of Natal, "is the careless preparation of the ground. Poor, shallow ploughing and the lack of after-cultivation of the soil are the two factors to which crop failure is largely due. It is impossible for any plant to withstand a severe drought when its roots lie in hard, dry soil. But put the same seed in deep, mellow earth, with a moisture-saving mantle, and it remains green after weeks of rainless weather. In the past the great mistake in South African agriculture has been over-irrigation, with little or no cultivation, and the soil soon becomes stagnant with a surplus supply of water. Sunshine and air are excluded, the fertility of the land impaired, and the root system of the crop often permanently injured. When farmers realise that most crops can be successfully grown on dry lands merely with good cultivation they will hesitate before embarking upon expensive irrigation schemes, and will seriously study the problem of better tillage."

Co-operative Food Supplies.

The following extract from a New Orleans (U.S.A.) exchange is of interest:—"A method of solving the cost of living was presented here to-day in the granting of a charter to the Consumers' Household Supply Company. The movement was initiated here a few days ago with a capital of \$50,000

and the announced purpose of purchasing a large farm and supplying the shareholders with many of the necessaries of life. In the beginning the products will be vegetables, poultry, and eggs. Eventually the company intends to establish a supply of dairy and cattle products. The company will be operated on a purely mutual basis, with just enough profit charged to pay the expenses of operation. If the corporation proves satisfactory it is said it will be enlarged and take into its scope thousands of people." While the idea has great possibilities, especially in regard to supply of eggs and dairy products to shareholders, a great deal of care and tact on the part of the controllers of the company will be required. It is probable that in some of our large towns a scheme of this character could be worked, and it would undoubtedly lessen the cost of living or give much better quality and wider variety of food at no increase in outlay.

Imports and Exports of Fruits and Plants.

During the month of June 9,616bush. of fresh fruits, 93 packages of plants, 12,747 bags of potatoes, and 52 bags of onions were inspected and admitted at Adelaide under the Vine, Fruit, and Vegetable Protection Act ; 990bush. of bananas (chiefly overripe) were rejected and destroyed. The exports to inter-State markets comprised 7,660bush. of fresh fruits, 3,603pkgs. of vegetables, and 328pkgs. plants, also examined at Adelaide. In addition, 572bush. of fresh fruits were examined and passed for inter-State markets at Clare, 228bush. of fresh fruits at Renmark, 108bush. of fresh fruits at Wirrabara, and 7pkgs. of plants at Stirling West. Under the Commerce Act 2,059bush. of fresh fruits, 63pkgs. of preserved fruits, 451pkgs. of dried fruits, and 6pkgs. of plants were exported to oversea markets during the same period. These were distributed as follows :—For London, 248 cases oranges, 401pkgs. Lexias, and 1pkg. preserved fruit ; for India and East, 1,771 cases apples, 10 cases oranges, and 52pkgs. preserved fruit ; for New Zealand, 30 cases of lemons, 10 cases preserved fruit, 50 cases dried fruit, and 6pkgs. of plants. Under the Quarantine Act 1,844pkgs. plants, seeds, bulbs, &c., were inspected and admitted from oversea sources.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

ROUP IN POULTRY.

"Belalie North" writes—"I have lost a number of fowls from some disease, and I would like to have some information *re* same and remedy. Symptoms—Observed going about with mouth open, sneezing, and shaking head; two died shortly after disease was discovered. Diphtheria powder blown down their throats seemed to relieve them. They are chicks three to four months old."

The Poultry Expert (Mr. D. F. Laurie) replies—"The symptoms point to roup. The open mouth is probably caused by accumulation of cheesy matter characteristic of some forms of the disease. I recommend that any accumulation of cheesy matter be carefully removed and the parts dressed with powdered bluestone. A teaspoonful of olive oil, to which may be added three or four drops each of eucalyptus oil and kerosene, may be administered daily. All affected fowls should be isolated, drinking vessels should be cleaned and scalded, and a few drops of kerosene added to the drinking water."

WEAKNESS IN YOUNG CALF.

"Miltalie" writes—"What is the best treatment for a calf which is very weak in its bowels about a week after being dropped?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"Give from 1oz. to 2ozs. of castor oil to clear out the bowels. If hand-fed, a little lime-water can be added to the milk."

PARALYSIS AFTER CALVING.

"Miltalie" writes—"What caused a cow, which seemed in good health before calving, to be unable to rise after, and in about a day died? She had the calf in a paddock, and it was a rough night—the calf is strong and well."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"Paralysis following calving."

STALLION AND ENTIRE HORSE.

"Miltalie" writes—"What is the difference between a stallion and entire horse?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"In Australia the two terms are practically synonymous. A stallion may be defined as a male horse kept for breeding purposes. An entire horse is one which has not been castrated."

RUPTURE IN YOUNG PIGS.

"Hartley" writes—"Would like to know the cause of young pigs being ruptured, and whether it is advisable to cut them?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"Cause, congenital. Treatment consists in reducing the rupture and castrating at the same time."

GALL IN HORSE.

"Hartley" writes—"Would like to know whether the horse has a gall."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"The horse has no gall bladder."

ANTHRAX.

"Petina" writes—"Are cattle depastured on ground, where cattle had died from anthrax and were buried 6ft. deep, liable to get the disease?"

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—"Unless proper precautions have been adopted, yes."

CHICKEN POX IN POULTRY.

"P. M.," Kangaroo Island—"Could you tell me what is the matter with my fowls, as they are dying off very fast? Some two months ago I noticed one hen with her head covered with growths similar to warts; then one eye closed up. I washed her head and she seemed better, but younger ones are all dying. I am afraid the turkeys will get the same, as there is a lump coming under one eye."

The Poultry Expert (Mr. D. F. Laurie) replies—"Your chickens are suffering from chicken pox. Bathe the heads and affected parts with vinegar and water, and then apply carbolised glycerine (carbolic acid one part, glycerine 15 parts). Repeat again in a few days. The lump on turkey's eye is from another cause. You should cut open the lump, express the core of hard, cheesy material, and dress cut with boracic acid."

SCAB IN POTATOES.

"J. T.," Rendelsham, writes—"What causes scab on potatoes? Will scabby potato seed cause a crop of potatoes grown from same to be scabby?"

The Superintendent of Agriculture in the South-East (Mr. W. J. Colebatch, B.Sc.) replies—"The term 'scab' is applied to various forms of

rough excrescences on potato tubers. The scabby patches are characterised by formation of a large amount of cork tissue, which is sometimes confined to the surface, whilst at other times it may penetrate some distance into the substance of the tuber. One form of the disease is attributed to the invasion of a parasitic fungus known as *Oosporo scabies*. This is the more common form, in which more or less circular rough patches appear on the surface, and often increase to such an extent that the whole tuber becomes covered and sometimes cracks across, and is thereby depreciated in value. The fungus usually invades the tissues when the tubers are young and the skin soft. As a rule the quality of scabby potatoes is not much deteriorated, and they are still suitable for table purposes. Not infrequently this form of 'scab' is mistaken for the swellings due to the potato 'eel worm' and other causes. Roze has attributed another type of scab to a bacteria (*Micrococcus*), and a third form, in which large olive patches are seen on the surface of nearly full-grown tubers, has been ascribed to another fungus (*Sorosporium scabies*). The inevitable confusion which arises from similarity in appearance of the different forms of 'scab' will no doubt account in large measure for the conflicting nature of the opinions held in regard to this disease by potato-growers. It is generally conceded, however, by those who have made a close study of the matter that scabby potatoes should not be used for sets, at any rate without being properly treated; nor should land on which such tubers have been raised be planted with potatoes for several seasons. It may be taken as proven that scabby seed will inoculate clean land, and that where infected potatoes and infected soil are used, separately or in combination, a diseased crop is almost certain to be gathered. That form of the disease due to *Oosporo scabies* is encouraged by the application of lime, wood ashes, or farmyard manure, and is retarded by any substances such as sulphate of ammonia, superphosphate of lime, kainit, muriate of potash, sulphate of potash, or dissolved bones, which render the soil more acid. Curiously enough, the addition of lime in the case of *Sorosporium scabies* is said to prevent the disease. The pathogenic fungi have been known to exist in the soil for a period of six years without any host plant being present. In conclusion, it may be remarked the varieties vary widely in their susceptibility, the thicker skinned ones appearing to show greater resisting powers than the thin-skinned tubers."

"Datura Metel."

"J. P.," Green's Plains West—The plant you send is *Datura Metel*, indigenous in the Mediterranean region and India. It is not uncommon on the plains near Adelaide, and would probably be poisonous if animals were hungry enough to eat much of it. It is closely allied to *D. Stramonium*, the Thorn Apple or Devil Apple, which is a proclaimed plant, and has a very bad reputation.

SORE SHOULDERS IN HORSES.

Under this heading in our last issue, in replying to "R. C." Port Broughton, the following was quoted in error as being an application recommended by the Government Veterinary Surgeon:—"Sulphate of zinc, 1oz.; sugar of lead, 1oz.; water, 1oz.; and mix." This should read—Sulphate of zinc, 1oz.; sugar of lead, 1oz.; water, 1 quart; and mix.

BRACKISH WATER FOR POULTRY.

"Leghorn" writes—We are starting a poultry farm, and have selected a site on which we intend to build runs, &c., adjacent to which there is a spring of water which is a little brackish (good stock water), and from which it is our intention to water the poultry. Is it, in your opinion, necessary to have rainwater for this purpose, and would the brackish water be detrimental to the fowls?

The Poultry Expert (Mr. D. F. Laurie) replies—"The water will probably suit the fowls bred on the premises. The percentage of salts may be too great for poultry obtained from other parts. The easiest method of ascertaining the facts of the case is to procure a few common hens, enclose them and supply with the spring water only."

LUCERNE-GROWING.

In reply to a question by "E. M. W." re lucerne-growing, Mr. S. McIntosh (Manager Murray Bridge Experimental Farm) says—"Lucerne is not particular as to the class of soil as long as the tap-root gets down a fair depth; but without the aid of irrigation the soil should be of such a nature as to retain the natural moisture, at the same time possessing a slow but perfect drainage, as the plant does not like 'wet feet.' Fallow the land intended for sowing, and work it thoroughly as you would do for a good wheat crop, making sure that all weeds are eradicated. Use a dressing of $\frac{1}{2}$ cwt. mineral or bone super. per acre a week or so before planting the seed; then harrow and roll. On ordinary soils drill in from 12lbs. to 15lbs. of South Australian or guaranteed Hunter River seed; failing these, secure imported Provence. Seed must be covered as shallow as is possible. Follow with a light roller to press down the top soil and ensure the seed getting a fair start in life. When you do not intend to irrigate, sow in April or May for preference, so that the plant may make root during the winter, and thus be in a position to survive a dry spell in the late spring or early summer. Let the first growth attain a height of from 6in. to 8in. before cutting, which should (unless the locality is a late wet one) be left on the ground to serve as a dry mulch by so doing you will obtain stronger growth to follow. Around Jamestown it should not be too late to try a small area even now, provided the soil is ready and in perfect tilth, i.e., fit for an onion bed. With irrigation plant either in May or September, the former for preference. The land should be graded, with if possible a fall of from 2in. to 6in. in the chain according to its density; then ploughed and worked over before seeding. Do not have

the plots more than 5 chains in length. With the 'sprinkler' the grade does not matter. Personally, I am not imbued with the latter method of watering any area over an acre in extent. At Pekina we are flooding for a length of 4½ chains on 2½ in. of water for the first watering on well-graded soil."

REDWATER IN COWS AFTER CALVING.

"Sutherlands" writes—" (1) I would like to know the best remedy for red-water in cows after calving. I also have a cow which 24 hours after calving collapsed. After taking her into a stable she lay down as if she were dead for two days—very much blown up the second day. During the third day she passed water, when she gradually got round again, and is now better. (2) Would like to know the cause."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—" (1) Give the affected cow 1lb. Epsom salts and 1lb. treacle dissolved in a quart of lukewarm water. Afterwards give a teaspoonful of sulphate of iron and 1oz. of common salt in the food three times daily. Feed with wholesome, easily-digested food. (2) Various—low condition, weakness exposure, wet and cold, injuries to organs during calving, &c."

STRANGLES IN HORSES.

"Sutherlands" writes—" I would like to have a remedy for my horses, which are suffering from strangles."

The Government Veterinary Surgeon (Mr. J. F. McEachran, M.R.C.V.S.) replies—" Isolate the affected animals. Feed with bran mashes, and, if possible, green feed. Give the horses a dessertspoonful each of powdered saltpetre and hyposulphite of soda in the drinking water three times daily. Rub the throat and between the jaws with stimulating liniment, e.g., Elliman's embrocation. It is preferable to allow the abscess between the jaws to burst itself, but if it comes to a point the owner may lance it with a clean lance or knife. Afterwards allow free discharge, and keep clean with mild antiseptic wash. Horses should be kept in clean, healthy surroundings, and the premises should be thoroughly cleansed and disinfected."

BREEDS OF POULTRY FOR NEW DISTRICTS.

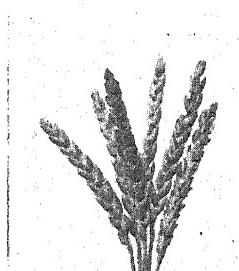
"T. E. H." Butler, writes—" Situated, as we are, in these new districts, away from markets, &c., I think it would pay us best to keep and breed table poultry rather than the lighter egg-producing fowl. I have a fair flock of White Leghorns, and ask your advice as to which is the best breed of the heavier kinds to cross with those I have to produce a good table bird, and at the same time be fair layers."

The Poultry Expert (Mr. D. F. Laurie) replies—" You will find a cross between the White Leghorn cock and Black Orpington hens suit you very well. White Wyandottes are good all-round birds, fair layers, and good for the table. I, however, prefer pure breeds, and think you will do well to get either Wyandottes or Black Orpingtons, and breed and keep them pure."

WHEAT IMPROVEMENT.

No. I.

By WM. ANGUS, B.Sc., Director of Agriculture.



CLEVELAND.

During the last half century or so a considerable amount of work has been done in the matter of wheat improvement, but, considering the importance of wheat as an article of human food, one is surprised that even more has not been accomplished in this most interesting field of work. Of late years there has been a great increase in the use of wheat among Eastern nations, and there has been expressed some concern that the increase in production is not likely to keep pace with the increase in population; indeed, it has

been predicted that within a comparatively short time the wheat production of the world will be quite inadequate to meet the demand. How far this state of affairs is likely to arise does not concern us in this article; but the mere possibility of its occurrence is disquieting, and brings home to us the need for still greater endeavor to improve the production of this staple article of food.

Improvement becomes possible through the tendency of the plant to variation. These variations may arise naturally; that is, the tendency to vary may be peculiar to the plant itself, or they may be induced by change of environment and hybridisation. By selection these variations are laid hold of and become fixed in the progeny of the plant.

The early workers in wheat improvement for the most part made use of selection of those variations which arose naturally. Amongst these were LeCoteur, Sheriff, Hallett, and later Hays of America, and the work accomplished by these and others working on these lines goes to prove that by means of selection alone considerable improvement can be brought about in such matters as yield, hardiness, immunity to disease, resistance to drought, and so on. But the work of wheat improvement has been carried much further of late years by inducing the plant to vary by means of hybridisation. Of course, in this work, too, selection plays a very important part both in regard to the parent stocks and also to the variations that occur. Those prominently associated with the work on these lines are the Garton Bro-

thers, England; Vilmorin, France; Pringle, Blount, and Saunders, in Canada; and Farrer, in Australia. The splendid work accomplished by these men has conclusively shown that improvement by breeding is no longer a theory, but an accomplished fact.



Plate 1.—Farrer's Federation.

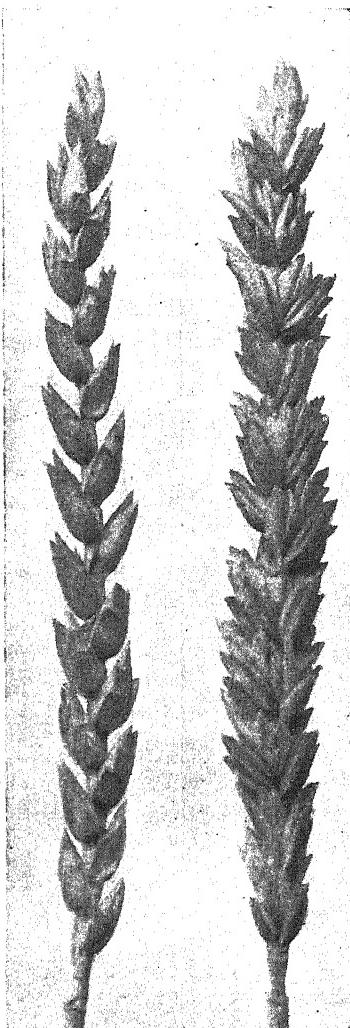


Plate 2.—Farrer's Bobs.

Within the last few years, however, perhaps the finest work of all—certainly the most scientific—has been accomplished by Professor Biffen, at Cambridge University, in his researches on the application of Mendel's laws to wheat-breeding. His work, an account of which appeared last year in this *Journal*, has given quite a new interest to wheat-breeding.

In a country like Australia, where wheat-growing holds such a leading place in production, the work of wheat improvement is of the very highest importance and utility. The varying conditions of climate and soil in the large area of country devoted to wheat-growing alone raise a very large question. That there are varieties of wheat suited to these varying conditions has already been proved by experiment, and this points to the need for systematic study of the requirements of these different districts, and of careful breeding of wheats to suit those requirements. There is also a large tract of country with a rainfall just under that which is now considered necessary for successful wheat-growing, and which, if a variety could be bred to suit such conditions, would be brought into a state of profitable production. It is quite within the range of possibility to produce a wheat that is more suited to our drier districts than any we now grow; and when this is accomplished and a more rational method of cultivation adopted in this class of country the wheat-growing area of Australia will be largely increased.

A good start in the improvement of our Australian wheats has been made by the work of the late Mr. Farrer, of New South Wales, to whom we are indebted for the best all-round variety now grown—one which is peculiarly suited to South Australian conditions—namely, Federation.

Farrer's quiet and unassuming manner did not allow of his work being sufficiently well known during his lifetime, but since his death—a few years ago—its value is being recognised. Not only has he left wheats of very considerable merit, but he has organised the work, has given an interest to it, and has pointed the way to others—with the result that now in New South Wales, Victoria, and also in this State centres have been established for specially dealing with this branch of work, and considerable progress has been made. The main object of this series of articles is to make known what provision has been made in this State for the improvement of our wheats, and to report the progress of work up to date.

PREPARATORY WORK.

1. Before anything could be done the Wheat Improvement Station at Parafield had to be made fit for wheat-growing, and this was no easy matter. However, of the 80 acres available there, about 65 acres are now in a splendid condition for this work, but as the area was found quite inadequate 400 acres of good wheat land on the Turretfeld property have recently been set aside for the purpose of still further extending the work being carried out at Parafield.

2. It then became necessary to secure foundation stocks, and to this end specimens of our best Australian varieties were selected and grown under observation. Samples of the grain from them were milled, and the flour from each tested. In addition to this a few of our best varieties were milled

in bulk, and the flours were made into bread by a competent baker, so that a very fair record has been made of the habits of growth and the yielding and milling properties of our wheats, and also of the baking qualities of the flours made from them.

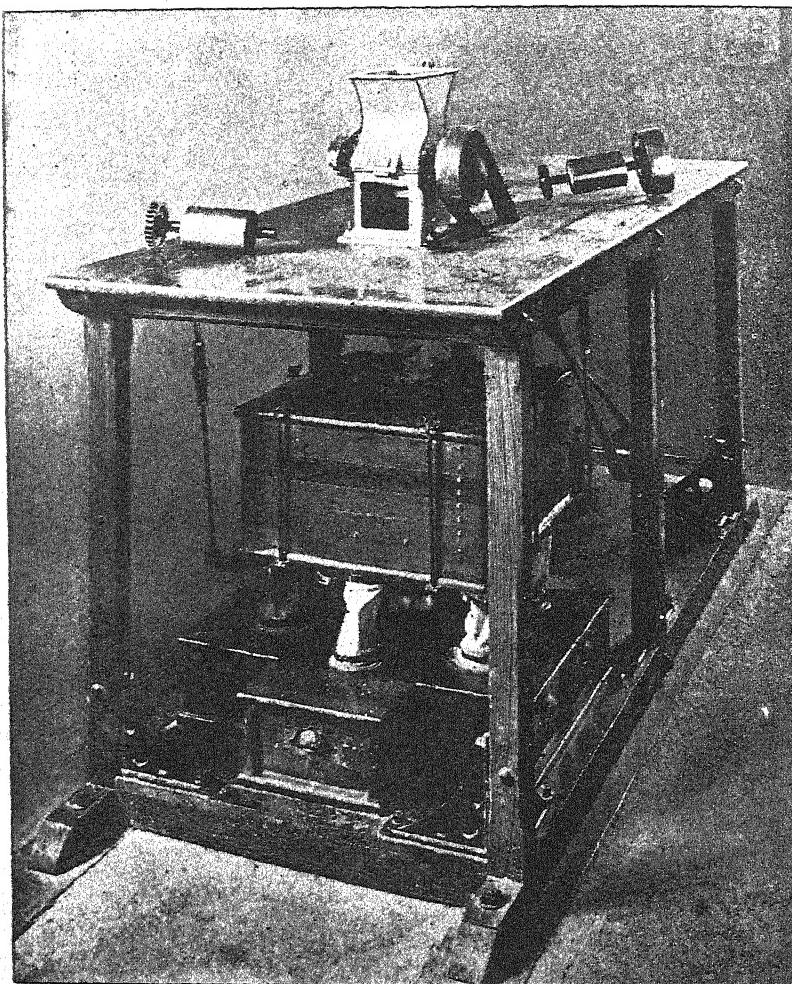


Plate 3.—Model Flour Mill for Milling Small Quantities of Wheat.

3. While this was going on specimens of foreign wheats possessing the special qualities in which our Australian varieties are deficient were secured. These consisted of Canadian and American, Hungarian, Russian, and Indian varieties. In all about 150 different varieties have been got together, but

a good many of these are useless for breeding purposes, and will be discarded. The special qualities of the various wheats above mentioned, as given by the English expert (W. Halliwell), are as follows :—" Australia grows a fine big wheat berry which is remarkable for yield, color, and sweet flavor,



Plate 4.—Huguenot—Dense Bar.



Plate 5.—Cleveland—Open Ear.

and in the best of seasons it also shows a fair strength. Indian wheats are on the whole noted for color and yield of flour. Strength is only possessed in a marked degree by three groups, namely those coming from Canada, other parts of America, and Russia."

From Hungary, where the milling industry has been so largely developed, come varieties which produce flour of excellent color and strength, while Indian wheats have the further advantage from a breeder's point of view of being very early.

DESCRIPTION OF AN EAR OF WHEAT.

The head or ear of wheat is known as a "spike," and consists of a central jointed stem bearing at each joint a spikelet, which consists of a group of flowers. These joints are really nodes, and the intervening spaces internodes, and according as these are short or long we have dense or open ears, as will be seen in Figures 4 and 5.

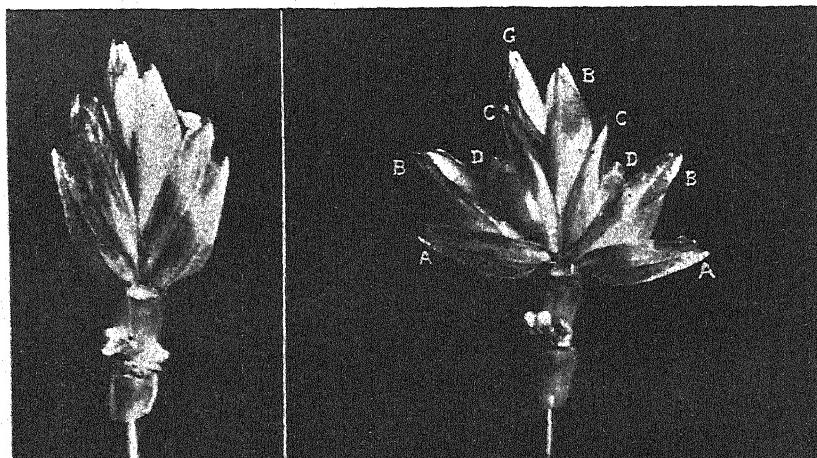


Plate 6.

Plate 7.

THE SPIKELET.

As above mentioned, the spikelets branch off at each of the joints, and are arranged alternately on the central stem or "rachis." Each spikelet bears two or more flowers, and ultimately carries the mature seed. A reference to Plates 6 and 7 will give some idea of the arrangement of the parts of the spikelet. In Plate 7 the parts have been pulled apart, so as to show them more clearly.

- (a) Represents the outer or infertile glumes.
- (b) Represents the inner or fertile glumes.
- (c) Represents the palea.
- (d) Represents the enclosed grain.
- (e) Represents a sterile floret, *i.e.*, one that has not borne grain.

The spikelet is often spoken of by the farmer as the chest, and the number of grains carried in the chest materially affects the yield.

Coming now to the structure of the flower and the organs of reproduction, Plate 8 shows the component parts of the flower at three different stages of growth of the generative parts. In this plate (a) signifies the anthers, which contain the pollen grains, or male elements of reproduction, borne on slender filaments; (b) is one of the stigmas upon which the pollen has to drop in order to reach (by growth) the ovary (c).

In Figure 1 these organs are at a stage suitable for emasculation, or the withdrawal of the anthers previous to cross-pollinating.

Figure 2 represents a stage when the anthers are just shedding their pollen, and therefore fit for being transferred from one flower to the stigmas of another.

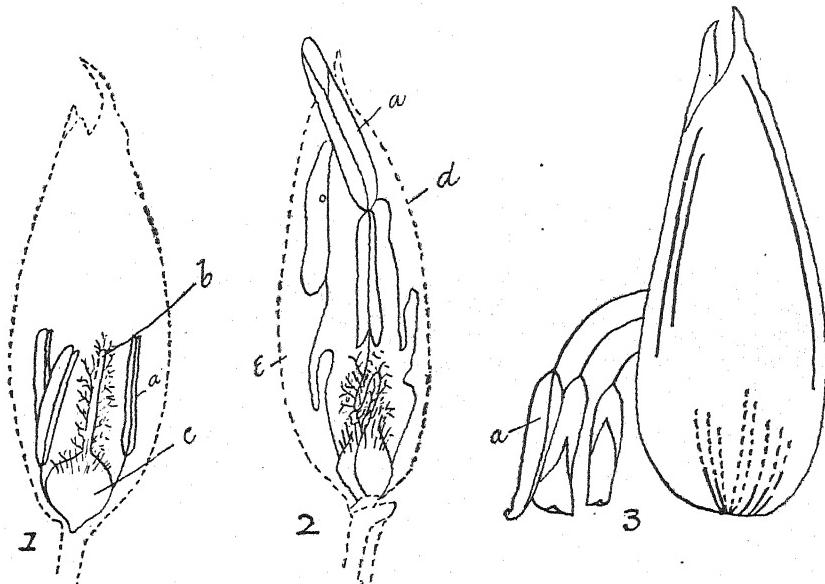


Plate 8.—Structure of the Wheat Flower.

Figure 3 shows a condition of flower familiar to wheatgrowers when anthers hang freely from the glumes, and most of the pollen has been shed. This is the stage when the wheat is popularly called "in flower."

The wheat under normal conditions has the peculiarity of self-pollination before the glumes open to allow the anthers to protrude.

These figures and notes will serve to explain the relation between the various parts of the ear, and prepare the reader for the actual work of crossing to be dealt with in the next article.

IMPROVING ALKALINE LANDS.

MUTUAL ANTAGONISM OF SALTS.—OSTERHOUT'S EXPERIMENTS.

By T. BRAILSFORD ROBERTSON, Ph.D. (California), D.Sc. (Adelaide), Associate Professor of Physiological Chemistry and Pharmacology in the University of California, U.S.A.

[Professor Robertson, a South Australian by birth and training, is at present visiting Adelaide. He has kindly consented to explain, in the pages of the *Journal* and for the benefit of our readers, some experiments in the treatment of saline soils made recently in America, and which promise to be of the highest importance to practical agriculture in Australia, both as regards the treatment of soil which suffers naturally from an excess of salt and of soil which has been rendered infertile by carbonate of soda or other salts contained in water from artesian bores.—ED.]

During the past four or five years a series of experiments has been carried out in California which are destined, I believe, to be of immense importance to the economic welfare of the world in general and of Australia in particular. It has been my privilege to be closely associated during this period with the author of these experiments, and to have personally witnessed and examined many of the results, and I esteem it at once a privilege and a duty to lay a brief account of these results before those of my fellow countrymen who are especially interested in the development and improvement of the agricultural arts in Australia.

It has been known for some years, thanks to the investigations of my former chief, Professor Jacques Lœb, now of the Rockefeller Institute, that solutions of almost any pure mineral salt, even of such an apparently innocuous substance as table salt (sodium chloride) are highly poisonous for living tissues which are bathed in them. Experiments upon almost every variety of animal tissue, however, concurred in showing that the toxic action of any one pure mineral salt could be largely or completely overcome by an appropriate admixture of other salts, sometimes in mere traces.

The extensive experiments of Lœb and his pupils had been almost exclusively conducted upon animal tissues. Some years ago, however, my former colleague in the University of California, Professor W. J. V. Osterhout, now Professor of Botany at Harvard, undertook the task of ascertaining whether similar phenomena are encountered when vegetable tissues are employed

as material for experiment. The results of many thousands of laborious experiments (which, I may add, are of the highest precision) were even more striking than those which had previously been obtained with animal tissues.

As an example of the type of phenomena encountered the following may be cited (1). The fresh-water alga (*Vaucheria sessilis*) will grow and live indefinitely in pure distilled water. It will also grow and live indefinitely in sea water which has been diluted 16 times with distilled water. If, however, the *Vaucheria* be placed in a pure solution of sodium chloride (common salt) in the concentration in which it occurs in the dilute sea water, the tissues are killed at once. If, on the other hand, it be placed in pure solutions of the remaining salts of sea water in the concentrations in which they occur therein, the result is practically the same—the tissues of the plant are injured and appreciable growth does not occur. If, however, these highly toxic individual constituents of sea water be mixed together in the proportions in which they occur in sea water—namely, 1,000 parts of sodium chloride to 78 parts of magnesium chloride, 38 parts of magnesium sulphate, 22 parts of potassium chloride, and 10 parts of chloride of lime (calcium chloride)—and the resultant mixture be properly diluted, a solution is obtained in which the *Vaucheria* lives and grows indefinitely. It cannot be argued that this is because the plant requires all of these substances for its nutrition, for, as I have said, it lives and grows indefinitely in distilled water, which, of course, contains none of them.

Another very typical series of experimental results is the following, in which the experimental material was wheat (2). All of the solutions (except, of course, the distilled water) were of the same concentration, namely, employing the technical nomenclature of physical chemistry, three twenty-fifths molecular. Sea water, it may be noted, for comparison, is half molecular.

Culture Solution.	Growth in 40 days (aggre- gate length of roots per plant in milli- meters).
Distilled water	740
Sodium chloride	59
Magnesium chloride	7
Potassium chloride	68
Calcium chloride	70
1,000 parts sodium chloride to 10 calcium chloride	254

(1) W. J. V. Osterhout.—“Extreme Toxicity of Sodium Chloride and its Prevention by Other Salts.” *Journal of Biological Chemistry*, 1 (1906), p. 363.

(2) W. J. V. Osterhout.—“On the Importance of Physiologically Balanced Solutions for Plants II. Fresh Water and Terrestrial Plants.” *Botanical Gazette*, 44 (1907), p. 259.

Culture Solution—continued.	Growth in 40 days (aggre- gate length of roots per plant in milli- meters).
1,000 parts sodium chloride to 22 parts potassium chloride and 10 parts calcium chloride	324
1,000 parts sodium chloride to 78 parts magnesium chloride and 10 parts calcium chloride	327
Dilute artificial sea water, <i>i.e.</i> , 1,000 parts sodium chloride to 78 parts magnesium chloride to 38 parts magnesium sul- phate to 22 parts potassium chloride to 10 parts calcium chloride.....	360

A very striking series of experiments, revealing the antagonism between potash and magnesia is the following (3). Liverworts (*Lunularia*) were the experimental material employed, and the solutions (except the distilled water) were all of .0375 molecular concentration :—

Culture Solution.	Percentage gained in length of Thallus after 150 days.
Distilled water	1,220
Potassium chloride	0
100 of potassium chloride to 5 of magnesium chloride	560
100 of potassium chloride to 10 of magnesium chloride	582
100 of potassium chloride to 25 of magnesium chloride	420
Magnesium chloride	0

The above examples are picked out almost haphazard from the multitude of results recorded by Osterhout. Precisely similar results were obtained with almost every order of terrestrial, marine, and fresh-water plants. Of surpassing interest to us are his experiments with wheat. Employing the growth (aggregate length) of the roots as a means of quantitative measurement, he has been able to construct curves showing the relationship between the composition of a mixture of two pure mineral salts and the extent of growth which occurs in their solution (4). These curves are highly characteristic, and show a marked maximum of growth in certain definite mixtures.

The application of these results to practical agriculture is patent. Hitherto "alkaline" soils, that is, soils containing a deleterious excess of one mineral salt, have been treated by flooding from above and draining out from below—

(3) W. J. V. Osterhout.—"The Antagonistic Action of Magnesium and Potassium." *Botanical Gazette*, 45 (1908), p. 117.

(4) W. J. V. Osterhout.—Article in Pringsheim's *Jahrbuch für Botanik* for 1909.

a treatment which is both costly and unsatisfactory. From the results obtained by Osterhout it would appear that the more rational, and probably less costly, procedure would be to *add* to the soil the amount of another mineral salt which would so neutralise the toxic action of the salts already present as to secure the maximum or, at least, the most profitable yield of the desired crop. Such a treatment would, in general, have to be annual, since alkali usually rises from below every year. From the known amount and kind of alkali which rises every year and from Osterhout's curves, to which I have alluded, it would be a simple matter to calculate the most profitable kind and quantity of antagonising salt to place upon the soil. "Sour" soils, containing an excess of magnesia, might be similarly treated; and, indeed, a variety of soils of low fertility might, it is conceivable, be increased in fertility by a study of the nature and amounts of mineral salts in the soil water, and a judicious addition of other salts.

Osterhout's results indicate that lime salts, among others, might be expected to effect the neutralisation of the toxic action of excess of magnesia; and it is, I believe, the practice in many localities to treat such soils by the addition of lime. On the other hand, Osterhout's results indicate that an excess of potash in soils might, it is probable, be successfully treated by the addition of a small amount of magnesia.

These results are, as I have indicated, very recent. There has not yet been time to test their applicability to practical agriculture. The time is, however, ripe for an exhaustive series of practical tests and applications upon the agricultural experiment stations of the world, and there is no reason why Australia should not be among the first to conduct such tests and to utilise their results to her own advantage.

Very recently a most important extension of Osterhout's experiments has been made by his pupil, Mr. Lipman, who finds that exactly similar phenomena prevail, in this respect, among the soil bacteria as among the higher plants—solutions containing an excess of certain salts being deleterious, while solutions containing an appropriate and determinate admixture of pure mineral salts are in the highest degree favorable.

For the practical guidance of those who may be sufficiently interested in experiments such as these as to endeavor to repeat them, it may be mentioned that, as usual in biological experiments, a very great number of individuals must be employed in each experiment, so as to obtain a reliable average and to eliminate chance and individual variation.

Any distilled water which is used must be distilled from glass, preferably soft Bohemian glass; must be condensed in a glass condenser, which must have been in constant use for at least four months previously; and must be stored in glass vessels. It should also be recollected that for every species of plant a most advantageous method of procedure exists, which has to be

separately ascertained in each instance. A multitude of such details of experimental procedure are to be found in Osterhout's papers, of which a list is given below.

In the testing of the applicability of such results as these to practical agriculture it is, of course, also to be remembered that the solution which actually bathes the roots of plants growing in soil is not necessarily of the same quantitative composition as that of the soil water which is not in the immediate neighborhood of the roots, for the roots of a plant exert a solvent action upon the surrounding particles of solid matter, and substances are thus carried into solution in the vicinity of the roots in proportions which differ more or less widely from those in which they occur in surrounding soil water.

For the use of those who are sufficiently interested to desire a further acquaintance with the literature of this subject I append the following bibliography :—

- W. J. V. OSTERHOUT.—“Extreme Toxicity of Sodium Chloride and its Prevention by Other Salts.” *Journal of Biological Chemistry*, 1 (1906), p. 363.
“On the Importance of Physiologically Balanced Solutions for Plants, I. Marine Plants.” *Botanical Gazette*, 42 (1906), p. 127.
“On Nutrient and Balanced Solutions.” University of California publications: *Botany*, 2 (1907), p. 317.
“On the Importance of Physiologically Balanced Solutions for Plants, II. Fresh Water and Terrestrial Plants.” *Botanical Gazette*, 44 (1907), p. 259.
“The Antagonistic Action of Magnesium and Potassium.” *Botanical Gazette*, 45 (1908), p. 117.
“The Value of Sodium to Plants by Reason of its Protective Action.” University of California Publications: *Botany*, 3 (1908), p. 331.
“The Nature of Balanced Solutions.” *Botanical Gazette*, 47 (1909), p. 48.
A paper by Osterhout, of which I have not got the title at hand, giving an exhaustive account of his quantitative experiments with wheat, is to be found in Pringsheim's *Jahrbuch für Botanik* for 1909.
- FLORENCE N. MAGOWAN.—“The Toxic Effect of Certain Common Salts of the Soil on Plants.” *Botanical Gazette*, 45 (1905), p. 45.
- CHAS. B. LIPMAN.—“Toxic and Antagonistic Effects of Salts as Related to Ammonification by *Bacillus Subtilis*.” *Botanical Gazette*, 48 (1909), p. 105.



A COMFORTABLE FARM HOMESTEAD.

SPRAYING AGAINST CODLIN MOTH.

A TEST WITH LEAD ARSENATES.

By GEORGE QUINN, Horticultural Instructor.

During the fruit season 1908-9 Mr. Thos. Sage, the well-known fruitgrower and preserver, of Nuriootpa, whilst acting as orchard inspector for the district of Barossa, urged that a demonstration of the efficacy of spraying with lead arsenate against the codlin moth should be carried out in the southern end of the Barossa district. Whilst agreeing with the object Mr. Sage had in view, it was deemed desirable at the same time to make a comparative test of the effectiveness of different brands of lead arsenate sold on the local market, and Mr. Sage agreed to perform the work personally if an orchard could be secured. The subject having been discussed with members of the Lyndoch Branch of the Agricultural Bureau, one of the members (Mr. Hugh Kennedy) offered his small orchard and undertook to co-operate with this department in carrying out the demonstration for the season.

This small orchard stands about a quarter of a mile distant from any other garden, and is situated about a mile north-west of the town of Lyndoch in a flat adjoining a permanent running creek. The soil is a stiff, dark clay loam; and the block selected forms a rectangle, with the rows of trees running about east and west. Being planted in squares, the cross lines point about north and south.

As the sketch plan indicates, eight rows containing 103 apple and one William's Bon Chrétien pear trees were selected. Besides these, five quince, seven lemon, three orange, one peach, and two apricot trees came into these rows. As only one more apple remained in the orchard, *i.e.*, in the ninth row, it was taken into the test.

The heads of the trees in this block had been allowed to grow very dense; consequently Mr. Sage undertook to thin them out, so as to admit sufficient light, and permit the fruit to be effectively sprayed, but not to stimulate the production of wood growth to the detriment of fruit setting. At the time this was done there was a good show for flower buds, and subsequent events proved this in the setting of an excellent crop of fruit on most of the trees.

NORTH—WIRE FENCE.

	EAST—DISTRICT ROAD.								
	Row 1.	Row 2.	Row 3.	Row 4.	Row 5.	Row 6.	Row 7.	Row 8.	Row 9.
Cleo.	Cleo.	Cleo.	Cleo.	Lord Nelson.	Cleo.	Cleo.	Cleo.	Dunn's S.	
Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Apricot.	Cleo.	—
Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	Cleo.	—
Cleo.	Peach.	Orange.	Orange.	Cleo.	Orange.	Quince.	Quince.	Quince.	—
W.B.C.	Apple.	Quince.	Lemon.	Lemon.	Lemon.	Quince.	Quince.	Quince.	—
Pear.			Lemon.	Lemon.	Lemon.	Lemon.	Dunn's Apricot.	S.	—
—	—								
Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	—
Lord Nelson.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	—
Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	Dunn's S.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Lord Nelson.	Rome B.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	—
Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	Rome B.	—
Rome B.	—	Lord Nelson.	Rome B.	Rome B.	—	—	—	—	—

Rows 1 and 6 sprayed 3 times Swift's arsenate of lead.

" 2 and 7 sprayed 3 times Platypus arsenate of lead.

" 3, 8, 9, sprayed 3 times Nicholl's arsenate of lead.

" 4 bandaged.

" 5 no remedy.

SKETCH PLAN OF ORCHARD.

The long rows running east and west were selected for the tests, because, being taken in this way, each row included a fairly even number of trees of each of the principal varieties, viz., Cleopatra, Dunn's Seedling, and Rome Beauty.

Row 1 contained 7 Rome Beauty, 2 Dunn's Seedling, 4 Cleopatra.

"	2	"	6	"	"	3	"	"	3	"
"	3	"	6	"	"	3	"	"	3	"
"	4	"	7	"	"	3	"	"	3	"
"	5	"	7	"	"	3	"	"	3	"
"	6	"	6	"	"	3	"	"	3	"
"	7	"	5	"	"	4	"	"	2	"
"	8	"	6	"	"	4	"	"	3	"

Rows 1, 3, 5, 7 each possessed a tree of Lord Nelson, whilst row 1 has the Bon Chrétien pear, and row 2 an unknown apple. The isolated tree of Dunn's Seedling in row 9 was included with row 8. Although sprayed in passing, the fruits on the quinces were not counted.

It will be seen from the above that the obtaining of a result fair to every row could be fully expected. The presence of a tree of the Lord Nelson variety in four of the rows to a certain extent discounted their position, because the fruits of this variety, owing probably to their size, are notoriously attractive to the moth in the early part of the season. For the arrangement of the plots full credit must be given to Mr. Sage, who suggested the divisions given below. With the exception of row 5, to which no remedy whatever was applied, all the trees in the rows were bandaged.

Rows 1 and 6, treated with Swift's arsenate, contained 13 Rome Beauty, 5 Dunn's Seedling, 7 Cleopatra, 1 Lord Nelson, 1 pear.

Rows 2 and 7, sprayed with Platypus arsenate, 12 Rome Beauty, 7 Dunn's Seedling, 5 Cleopatra, 1 unknown apple, 1 Lord Nelson.

Rows 3 and 8, sprayed with Nicholl's arsenate, 14 Rome Beauty, 7 Dunn's Seedling, 6 Cleopatra, 1 Lord Nelson.

Row 4, bandaged only, 7 Rome Beauty, 3 Dunn's Seedling, 3 Cleopatra.

Row 5, with no treatment, 7 Rome Beauty, 3 Dunn's Seedling, 3 Cleopatra, 1 Lord Nelson.

It will thus be seen that the section sprayed with Swift's lead arsenate contained 27 trees; sprayed with Platypus lead arsenate contained 26 trees; sprayed with Nicholl's lead arsenate contained 28 trees; not sprayed, but bandaged only, 13; no remedy applied, contained 14 trees.

Mr. Kennedy agreed to cultivate the soil, apply bandages to the tree stems where required, to examine the bands weekly, recording separately in a book supplied for the purpose all caterpillars caught in each row. The fallen fruits were to be collected along each row weekly, and the infested separated from those not injured by the codlin moth larvæ, a separate record being

noted of these fruits. As the fruit reached maturity and was harvested, similar records were to be taken and placed to the credit of the rows from which the fruits originated.

In the early stages the fallen fruits were recorded in numbers, but as the season advanced they were measured in gallons and later in bushel cases. In making up my computations from the figures supplied by Mr. Kennedy, 150 apples have been taken as equivalent to an average bushel.

Owing to the small area available for treatment it was deemed undesirable to use more than three brands of lead arsenate. Those selected were the well-advertised American article known as "Swift's," a compound prepared by a Victorian firm and sold under the brand of "Platypus," the third being a local production prepared by Messrs. Bickford & Sons under the brand of "Nicholl's" arsenate of lead. Samples of these analysed by Mr. W. A. Hargreaves, Government Analyst, yielded the following results:—

	Moisture.	Lead, calculated as Pb. O.	Arsenic—Total, calculated as As_2O_5 .	Arsenic—Water Soluble, cal- culated as As_2O_5 .	Cost.
Swift's....	47·10	35·66	15·17	0·35	2s. per lb. in 1lb. jars
Platypus...	68·90	22·87	7·01	0·10	1s.5d. per lb. in 2lb. jars
Nicholl's ...	25·95	48·99	15·62	0·08	1s.4d. per lb. in 2lb. jars

It will be noted from this table that the arsenic contents of the "Platypus" sample were very low, but the pleasing feature about all three is the comparatively insignificant percentage of arsenic in a water-soluble form. This is the condition in which arsenic acts in a destructive manner upon vegetation, and the absence of any appreciable scorching of the foliage during these sprayings confirms the analyst's determinations in this respect.

The three samples were used in even quantities, viz., 1lb. in 20galls. of water—one part by weight in 200 parts of water—and not upon any basis which their relative arsenical contents might suggest. In the operation of liquefying the arsenates both Mr. Sage and Mr. Wishart, who continued the work, expressed the opinion that in this particular Swift's preparation was preferable to either of the others used. For greater convenience in securing correct proportions, these samples were purchased in 1lb. and 2lb. jars. In quoting the respective prices, it is only fair to state that considerable reductions are made on all of these brands when purchased in greater quantities.

To prevent injuries from the black spot fungus (*Fusicladium dendriticum*) it was decided to combine Bordeaux mixture with the first arsenical dressing.

The normal Bordeaux, viz., 6lbs. bluestone, 4lbs. quicklime, and 40galls. of water, was compounded in the usual manner, and the lead arsenates added at the rate previously stated, *i.e.*, 1lb. to 20galls. The first spraying was applied on October 19th, 1909, to all the sprayed sections excepting the Rome Beauty trees. On November 11th, the petals having fallen from these, the same spraying was given to the Rome Beauty variety only. On December 13th all of the treated rows were sprayed with their respective lead arsenates. On January 14th, 1910, the spraying was again repeated. An additional (fourth) spraying was given on February 22nd to the Rome Beauty and Dunn's Seedling trees.

A considerable number of apples developed a fair amount of russetting on the skin; but, whilst this may have been attributable to the effects of the spraying, there is not sufficient evidence to connect it with the combination of the Bordeaux mixture with the lead arsenates, as similar russetting of the fruit was seen in orchards in the district where this combined form was not used. I am disposed to suspect this russetting is due to the rapid evaporation which follows upon spraying when drying winds are experienced. In none of the sprayed sections did any appreciable amount of scorching of the foliage occur, though it cannot be claimed to have been entirely absent. With the exception of the first, the sprayings were not applied at the intervals which are deemed most effective in checking the codlin moth in this State. Those whose experience entitles their opinions to the greatest respect claim the best results from arsenical sprayings when the first two applications are given within a fortnight of each other, with a third following three or four weeks later; and in the proximity of badly infested orchards another dressing about a month later where late maturing varieties, such as Rome Beauty, Stone Pippin, Nickajack, &c., are grown. The longer intervals in this instance were caused by a change taking place in the inspectorial staff, Mr. Sage unfortunately retiring to re-enter private business, and Mr. Wishart, although extremely capable, did not take up the work until several weeks had elapsed. These gentlemen did the spraying in person, and as they are both thoroughly practical, intelligent orchardists, no further assertion of good work need be advanced here. The pump used was made by the "Friend" Manufacturing Company, U.S.A., and was fitted with an automatic agitator. The distributing nozzles, throwing a moderately coarse spray, were also made by the same firm.

Owing to some not clearly understood cause the Dunn's Seedling fruits, of which there was a good crop, cracked in a ruinous manner. As this occurred on sprayed and unsprayed sections alike it cannot be attributed to the treatment. This cracking on the Dunn's Seedling apples was an exaggerated extension of the coarse russetting which surrounds the stalk cavity, and in wet districts of South Australia often renders this otherwise estimable apple unprofitable to the grower.

According to the data supplied by Mr. Kennedy, the first fallen infested apples were picked up on December 7th, 1909, and the crop was finally harvested on March 26th, 1910. The examination of the bandages began on December 7th, 1909, and the first caterpillars were killed beneath the bands on January 1st, 1910. After soaking rains had occurred in May and early June the final examination of the bandages was made by Inspector Wishart on June 10th, two and a half months after the harvesting was completed, when a total of 278 caterpillars was killed in all sections, showing that the insects seek the refuge of the tree stem when the ground or other places of refuge become cold and wet.

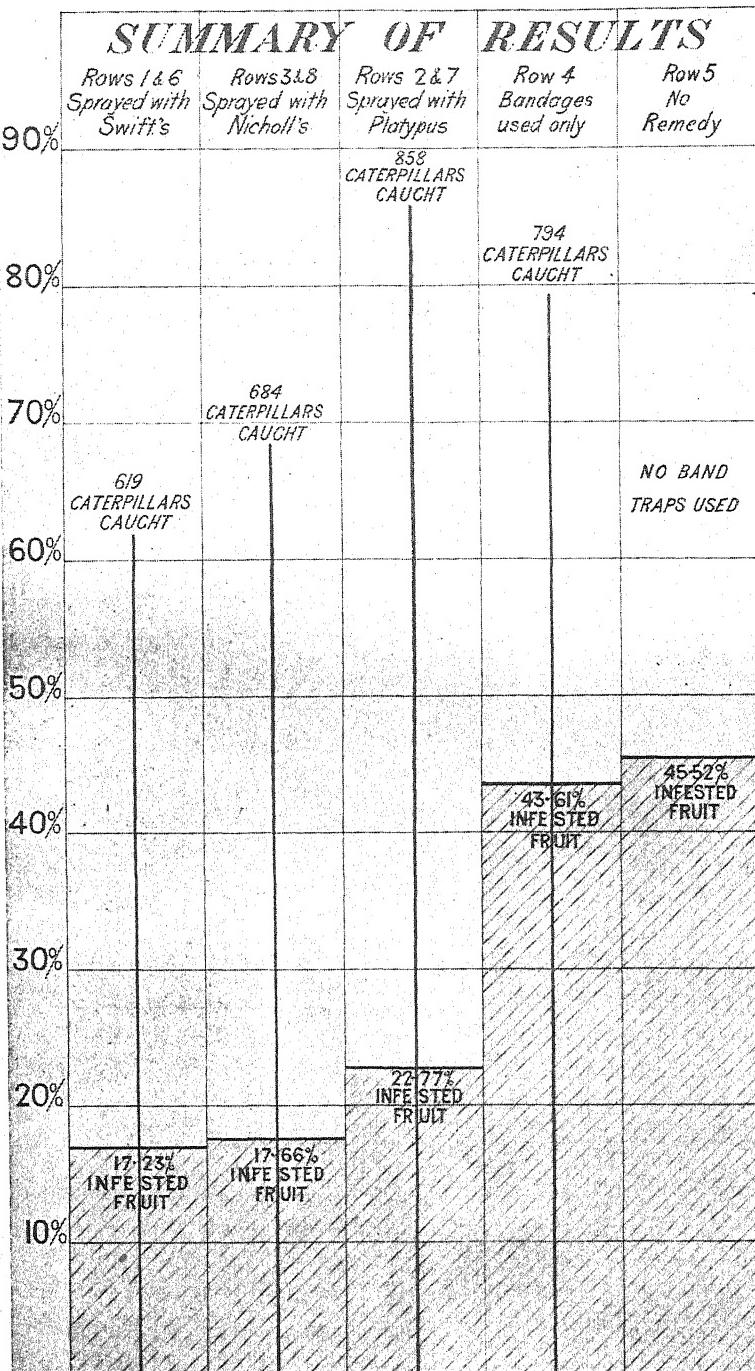
The following table, compiled from Mr. Kennedy's records, shows the resulting yields of fruit :—

	Total.	Sound.	Infested by Codlin Moth.	Caterpillars Caught in Bands
Row 1	Bushels. 35	Bushels. 30	Bushels. 5	272
" 2	31 $\frac{1}{2}$	25	6 $\frac{1}{2}$	415
" 3	30 $\frac{3}{4}$	26	4 $\frac{3}{4}$	390
" 4	33 $\frac{1}{4}$	18 $\frac{3}{4}$	14 $\frac{1}{2}$	746
" 5	36 $\frac{1}{4}$	19 $\frac{3}{4}$	16 $\frac{1}{2}$	No bands used
" 6	31 $\frac{3}{4}$	25 $\frac{1}{4}$	6 $\frac{1}{2}$	292
" 7	30	22 $\frac{1}{2}$	7 $\frac{1}{2}$	358
" 8	30 $\frac{1}{8}$	24 $\frac{3}{8}$	5 $\frac{3}{4}$	204

A summary of the results obtained from the respective treatment gives the following :—

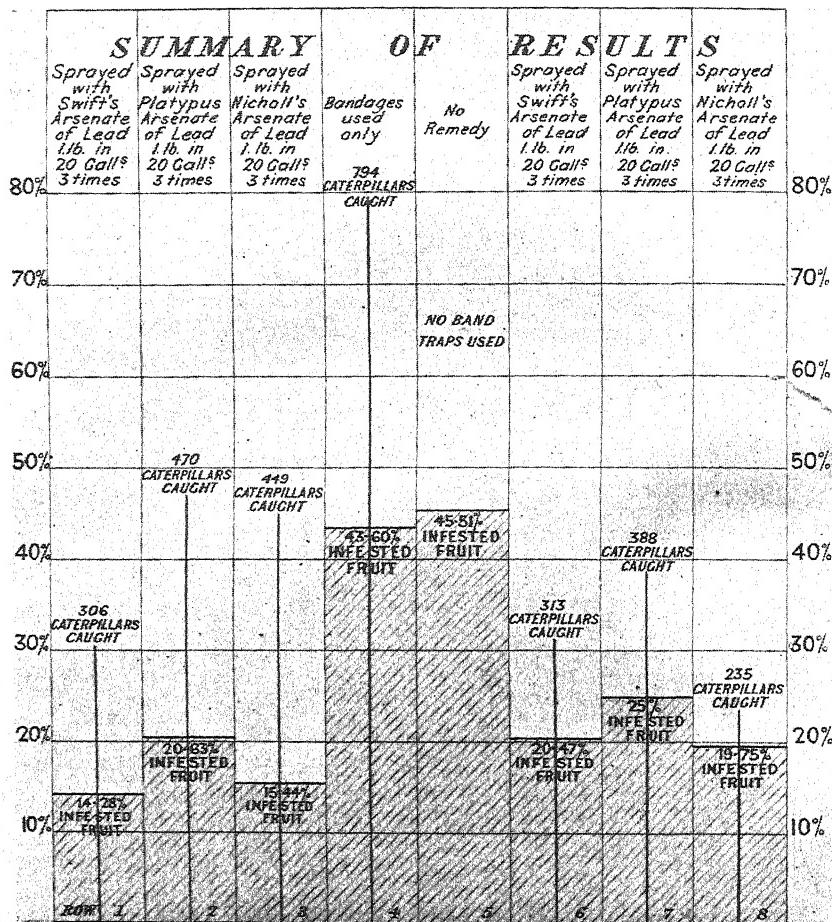
Rows	Treated with.	Total Yield.	Sound Fruit.	Percentage.	Caterpillars Caught.
1 & 6	Swift's arsenate ...	Bushels. 66 $\frac{3}{4}$	Bushels. 55 $\frac{1}{4}$	82.77	619
2 & 7	Platypus arsenate ..	61 $\frac{1}{2}$	47 $\frac{1}{2}$	77.23	858
3 & 8	Nicholl's arsenate ..	60 $\frac{7}{8}$	50 $\frac{3}{8}$	82.34	684
4	Bandages only	33 $\frac{1}{4}$	18 $\frac{3}{4}$	56.39	794
5	No remedy	36 $\frac{1}{4}$	19 $\frac{3}{4}$	54.48	—

This indicates that, allowing for differences attributable to experimental error, there is nothing as far as these results show between Swift's and Nicholl's in so far as effectiveness in preventing attacks of codlin moth is concerned, but the retail price is in favor of the latter. Unless, however, the locally manufactured article be improved in its mixable-with-water capabilities this



advantage in price may not prove a sufficient inducement for its acceptance by the busy orchardist.

In studying these tables one is much puzzled to understand the vast difference between the total number of codlin larvae trapped in the bands and the number of fruits found burrowed by these insects. For the present one must remain partially satisfied with the explanation that many are killed



or removed in the fallen infested fruits; but a liberal estimate of these reveals a leakage elsewhere, and the only presumption at present available is that great numbers enter the soil.

For assistance given the writer's thanks are due and are hereby tendered to Messrs. Kennedy and Denholm, of Lyndoch, and Messrs. Sage and Wishart, of Nuriootpa and Angaston respectively.

AGRICULTURAL STATISTICS.

RECORD WHEAT HARVEST.

The agricultural statistics for the year 1909-10 relating to cereals, hay, and fodder, which have been compiled by Mr. W. L. Johnston and his staff, have been issued by the Government Statist (Mr. L. H. Sholl) a month earlier than usual. The result of the year's operations may be seen from the following figures :—

	Area. Acres.	Yield. Bushels.	Average in Bushels. 1909-10. 1908-9.	
Wheat....	2,216,397 ..	25,133,851 ..	13·26 ..	11·45
Oats.....	184,255 ..	1,209,131 ..	14·17 ..	17·54
Barley....	46,121 ..	691,424 ..	16·50 ..	18·39

Accompanying the statistics, which reveal a most prosperous state of affairs, is the following interesting report :—

WEATHER CONDITIONS.

The season opened late, the first good rainfall occurring in the latter part of April. From then to the end of August the weather conditions were specially favorable for a record yield. The approximate mean rainfall over the whole of the agricultural areas from April to September was 19·66in., being 4·40in. in excess of the previous season and 4·68in. above the mean for 49 years. The average for the month of August was 4·79in., and ranks as one of the wettest in the history of the State. A very dry spell was experienced during September and October, followed during the first week in November by fierce hot winds, which considerably damaged the crops. Even then a good harvest was a certainty, but the splendid November rains, accompanied by specially favorable harvesting weather in December and January, resulted in the garnering of the record harvest of the State. On November 30th, 1909, a cautious forecast of 20,139,575bush. was issued, with the expectation of it being largely exceeded should the harvesting season be favorable. This fortunately was so. The final results give a yield of 25,133,851bush., or an increase over the forecast of 4,994,276bush. The following table shows the approximate mean rainfall in the counties for the whole State and in each of the five divisions for the year 1909 and the mean for the last five seasons :—

APPROXIMATE MEAN RAINFALL IN COUNTIES.

Year.	Total all Counties.	Divisions.				
		I. Central.	II. Lower North.	III. Upper North.	IV. South- Eastern.	V. Western.
1909.....	Inches. 17·64	Inches. 21·75	Inches. 14·85	Inches. 11·43	Inches. 25·77	Inches. 14·38
Mean five years.	16·09	19·03	15·09	11·73	21·59	13·03

ACREAGE CULTIVATED.

The total area under cultivation with cereals for grain, hay, and fodder was 2,474,501 (2,267,925) acres—an increase of 207,176 acres. The following table shows at a glance the distribution of the cultivated area under the chief crops (wheat, barley, oats, and other cereals), whether for grain, hay, green fodder, or fed off, together with the area under fallow in each division of the State:—

Total Area under Cereal Cultivation for Grain, Hay and Fodder, and Fallow.
(The figures in brackets are those of the previous season.)

Division.	Wheat.	Barley.	Oats.	All Other Cereals.	Fallow.
Central	736,291 (691,726)	27,672 (28,871)	85,276 (73,473)	14,406 (15,088)	453,373 (398,755)
Lower North	641,491 (594,488)	2,766 (3,353)	34,299 (20,156)	6,174 (4,300)	473,762 (441,745)
Upper North	298,896 (327,645)	170 (171)	1,922 (1,051)	1,542 (768)	191,357 (188,895)
South-Eastern	198,597 (133,382)	11,141 (12,181)	49,973 (46,508)	5,401 (6,595)	13,853 (12,894)
Western	341,122 (296,039)	4,372 (3,643)	12,785 (7,632)	205 (255)	66,105 (54,897)
Total 1909-10.....	2,216,397	46,121	184,255	27,728	1,198,450
Total 1908-9.....	2,043,280	48,219	148,820	27,006	1,097,186
Increase or Decrease	173,117	- 2,098	35,435	722	101,264

The increase of 101,264 acres placed in fallow substantially indicates that a much larger area will be sown for the coming season.

PRODUCTION.

Cereals.

Wheat.—25,133,851 (19,397,672) bushels; increase, 5,736,179; average per acre, 13-26 (11-45) bushels; increase, 1-81bush.

Barley, all kinds.—Total, 691,424 (825,740) bushels; decrease, 134,316; average per acre, 16-50 (18-39) bushels.

The chief kinds were returned under the following headings:—Malting, 446,825 (576,685) bushels; Cape, 218,771 (included in "other," 1908-9); other, 25,828 (249,055).

Cape barley represents the whole of that kind grown in the State. The greater portion of Cape barley is used for feed purposes, though inquiry has shown that a fair quantity of special quality has been sold for malting purposes.

Oats.—1,209,131 (1,280,235) bushels; decrease, 71,104bush.; average per acre, 14-17 (17-54) bushels.

Rye.—15,021 (9,596) bushels; increase, 5,425bush.

Hay, all kinds.—Total, 574,475 (591,141) tons; decrease, 16,666 tons; average per acre, 1-35 (1-39) tons.

The following are the chief kinds:—Wheaten, 439,469 (488,174) tons; decrease, 48,705 tons; average per acre, 1-38 (1-40) tons. Oaten, 121,995 (92,658) tons; increase, 29,337; average per acre, 1-26 tons.

The November forecast for wheaten hay was 485,950 tons; the final results failed to reach this estimate by 46,481 tons.

Straw.—22,646 tons of straw were saved from the various cereal crops, being a decrease of 8,390 tons.

VALUE OF WHEAT CULTIVATION.

To show the importance of wheat cultivation to the State, it is only necessary to mention that the production of wheat has averaged for each of the last five seasons 20,255,476bush. Including the wheaten hay crop, the mean annual value for the five seasons was £4,874,007, or £12 12s. per inhabitant.

The value of the 1909-10 grain and hay crop on the average prices to date is £5,831,243.

As intimately associated with wheat culture the fact should be remembered that the implements and machinery owned by the cultivators were valued by the owners in 1909 at £1,696,916; and, further, that the prosperity of the man on the land is directly reflected in the flourishing condition of several of the secondary industries of the State. In 1909 there were 59 agricultural implement and machine factories, each employing four or more hands, the total being 1,350 hands, who received in wages £107,000, and turned out work to the value of £320,000.

The following tables concisely but eloquently demonstrate the facts of wheat culture in each division of the State for the season 1909-10 and the mean for the last five seasons:—

Season.	Total for State.	Divisions.				
		I. Central.	II. Lower North.	III. Upper North.	IV. South- Eastern.	V. Western.
<i>Acreage.</i>		Acres.	Acres.	Acres.	Acres.	Acres.
1909-10	1,895,738	586,234	554,975	260,090	181,362	313,077
Mean last five seasons	1,757,281	557,950	531,004	317,985	100,402	249,940
<i>Produce.</i>		Bush.	Bush.	Bush.	Bush.	Bush.
1909-10	25,133,851	8,331,905	9,126,621	2,873,349	2,027,507	2,774,469
Mean last five seasons	20,255,476	6,810,770	7,581,965	2,834,676	1,036,383	1,991,682
<i>Average.</i>		Bush.	Bush.	Bush.	Bush.	Bush.
1909-10	13.26	14.21	16.45	10.99	11.18	8.86
Mean last five years	11.53	12.21	14.28	8.91	10.32	7.97

We have reason to be proud of the record for the whole State. For 1909-10 season—Wheat for grain, 1,895,738 acres; 25,133,851bush.; 13.26bush. average per acre. Mean last five seasons—Wheat for grain, 1,757,281 acres; 20,255,476bush.; average 11.53bush. per acre.

The culture in the Lower North division is specially worthy of note. 1909-10 season—Wheat for grain, 554,975 acres; 9,126,621bush.; 16.45bush. average per acre. Mean for last five seasons—for grain, 531,004 acres; 7,581,965bush.; 14.28bush. average per acre.

EXPORTABLE SURPLUS.

The stocks of wheat and flour on hand on December 31st are not at present available, but it is certain that they were very low. Excluding these, the exportable surplus from the 1909-10 crop is well over 21,000,000bush., the greater proportion of which has already been shipped.

Division and County.	Wheat.					
	Area.			Yield.		
	1907-8.	1908-9.*	1909-10.†	1907-8.	1908-9.	1909-10.
I. CENTRAL—						
Adelaide	Acres.	Acres.	Acres.	Bushels.	Bushels.	Bushels.
14,860	10,199	14,306	180,684	136,185	205,884	
Albert	37,715	40,600	47,449	204,403	352,308	502,290
Alfred	19,742	21,128	29,252	131,679	196,863	349,507
Carnarvon	2,611	1,574	2,066	14,308	11,379	12,180
Eyre	70,378	61,594	56,361	509,329	525,116	572,749
Fergusson	125,947	123,634	137,478	1,593,324	1,527,910	2,064,721
Gawler.....	108,612	106,673	117,202	1,446,305	1,471,890	1,977,456
Hindmarsh	19,985	18,137	22,330	225,073	220,807	299,185
Light	86,198	79,707	93,173	1,639,928	1,265,425	1,622,477
Sturt	65,480	62,300	66,617	533,552	626,761	725,456
Total	551,528	525,546	586,234	6,483,645	6,334,644	8,331,905
Increase	—	—	60,688	—	—	1,997,261
Decrease	—	—	—	—	—	—
II. LOWER NORTH—						
Burra	21,715	21,208	21,262	233,798	290,363	311,682
Daly	222,402	208,420	227,457	2,723,488	2,562,885	3,521,065
Hamley	30	—	40	120	—	200
Kimberley	18,465	13,906	12,371	111,506	121,222	114,524
Stanley	128,891	129,554	153,114	1,897,888	2,027,675	2,892,396
Victoria.....	132,637	117,443	137,176	2,307,872	1,737,746	2,261,669
Young	2,693	2,734	3,555	15,025	20,364	25,085
Total	526,833	493,265	554,975	7,289,697	6,760,255	9,126,621
Increase	—	—	61,710	—	—	2,366,366
Decrease	—	—	—	—	—	—
III. UPPER NORTH—						
Blachford	9,883	9,625	9,205	71,886	59,720	65,980
Dalhousie	118,018	97,775	87,891	1,035,552	966,732	936,160
Derby	—	—	—	—	—	—
Frome	114,739	102,067	100,202	1,431,242	1,145,021	1,320,864
Granville.....	24,749	18,719	15,955	101,914	78,914	119,000
Hanson	25,079	24,850	21,098	155,057	127,044	187,931
Herbert	8,873	7,293	6,612	50,313	52,032	45,298
Lytton	—	—	—	—	—	—
Newcastle	29,072	26,467	19,104	183,651	160,400	197,916
Taunton	—	—	23	—	—	200
Total	330,413	286,796	260,090	3,029,615	2,589,863	2,873,349
Increase	—	—	—	—	—	283,486
Decrease	—	—	26,706	—	—	—

* Including 1,370 acres failure.

† Including 5,763 acres failure.

Division and County.	Wheat.					
	Area.			Yield.		
	1907-8.	1908-9.*	1909-10.†	1907-8.	1908-9.	1909-10.
IV. SOUTH-EASTERN—	Acres.	Acres.	Acres.	Bushels.	Bushels.	Bushels.
Buckleuch	9,768	18,619	28,119	60,569	151,049	228,831
Buckingham	20,864	19,951	24,584	189,457	230,236	222,898
Cardwell	—	1,045	1,966	—	6,060	12,567
Chandos	24,832	55,637	87,641	176,047	674,360	1,141,150
Grey	5,107	4,351	7,518	86,980	76,043	116,291
MacDonnell	2,917	2,850	5,875	37,338	33,023	55,171
Robe	1,525	1,774	4,318	13,277	22,327	46,110
Russell	15,340	16,701	21,341	101,530	141,605	204,489
Total	80,353	120,928	181,362	665,198	1,334,703	2,027,507
Increase	—	—	60,434	—	—	692,804
Decrease	—	—	—	—	—	—
V. WESTERN—	—	—	—	—	—	—
Buxton	—	—	—	—	—	—
Dufferin	3,950	4,855	5,271	15,191	30,880	46,467
Flinders	48,137	54,988	64,835	387,201	480,414	520,808
Hopetoun	6,941	7,120	7,389	41,497	66,842	67,585
Jervois	45,607	56,088	73,221	403,423	673,666	797,921
Kintore	17,729	17,975	21,786	74,487	141,679	136,192
Le Hunte	—	—	290	—	—	2,700
Manchester	—	50	90	—	700	750
Musgrave	10,992	12,828	15,285	98,425	112,220	136,019
Robinson	55,211	54,356	59,099	386,678	422,019	523,004
Way	52,800	58,706	65,811	260,500	449,787	543,023
York	—	—	—	—	—	—
Total	241,367	266,966	313,077	1,667,402	2,378,207	2,774,469
Increase	—	—	46,111	—	—	396,262
Decrease	—	—	—	—	—	—
SUMMARY.	—	—	—	—	—	—
I. CENTRAL	551,528	525,546	586,234	6,483,645	6,334,644	8,331,905
II. LOWER NORTH	526,833	493,265	554,975	7,289,697	6,760,255	9,126,621
III. UPPER NORTH	330,413	286,796	260,090	3,029,615	2,589,863	2,873,349
IV. SOUTH-EASTERN	80,353	120,928	181,362	665,198	1,334,703	2,027,507
V. WESTERN	241,367	266,966	313,077	1,667,402	2,378,207	2,774,469
GRAND TOTAL	1,730,494	1,693,501*	1,895,738†	19,135,557	19,397,672	25,133,851
Increase (1909-10)	—	—	202,237	—	—	5,736,179
Decrease	—	—	—	—	—	—

* Including 1,370 acres failure.

† Including 5,763 acres failure.

Division and County.	Average Yield per Acre.			Rainfall (Approximate Mean).		
	1907-8.	1908-9.	1909-10.	1907.	1908.	1909.
I.—CENTRAL—	Bushels.	Bushels.	Bushels.	Inches.	Inches.	Inches.
Adelaide	12.16	13.35	14.39	23.10	29.13	37.53
Albert	5.42	8.68	10.59	10.68	13.14	12.06
Alfred	6.67	9.32	11.95	10.22	11.59	10.46
Carnarvon	5.48	7.23	5.90	21.31	19.95	25.80
Eyre	7.24	8.53	10.16	11.74	14.02	14.12
Fergusson	12.65	12.36	15.02	14.85	16.36	20.39
Gawler	13.32	13.80	16.87	14.66	17.39	21.18
Hindmarsh.....	11.26	12.17	13.40	18.92	22.83	29.93
Light	19.03	15.88	17.41	17.52	19.80	24.74
Sturt	8.22	10.06	10.89	13.67	16.79	21.26
Total	11.76	12.05	14.21	15.67	18.10	21.75
Increase	—	—	2.16	—	—	3.65
Decrease	—	—	—	—	—	—
II. LOWER NORTH—						
Burra	10.77	13.69	14.66	11.90	15.51	12.20
Daly	12.25	12.30	15.48	14.16	18.48	18.90
Hamley	4.00	—	5.00	10.22	11.59	10.46
Kimberley	6.04	8.72	9.26	13.18	15.94	12.39
Stanley	14.72	15.65	18.89	17.36	22.86	22.02
Victoria	17.40	14.80	16.49	18.22	21.52	18.46
Young	5.58	7.45	7.06	10.86	12.11	9.55
Total	13.84	13.71	16.45	13.70	16.86	14.85
Increase	—	—	2.74	—	—	—
Decrease	—	—	—	—	—	2.01
III. UPPER NORTH—						
Blachford	7.27	6.20	7.17	13.81	13.64	12.85
Dalhousie	8.77	9.89	10.65	13.82	16.81	14.30
Derby	—	—	—	6.76	8.13	6.12
Frome	12.47	11.22	13.18	15.65	19.48	17.01
Granville	4.12	4.22	7.46	11.37	13.44	12.42
Hanson	6.18	5.11	8.91	12.81	13.74	11.30
Herbert	5.67	7.13	6.85	10.14	11.52	8.64
Lytton	—	—	—	8.32	9.33	7.53
Newcastle.....	6.32	6.06	10.36	12.55	14.75	13.18
Taunton	—	—	8.70	11.38	12.50	10.92
Total	9.17	9.03	11.05	11.66	13.33	11.43
Increase	—	—	2.02	—	—	—
Decrease	—	—	—	—	—	1.90

Division and County.	Average Yield per Acre.			Rainfall (Approximate Mean).		
	1907-8.	1908-9.	1909-10.	1907.	1908.	1909.
IV. SOUTH-EASTERN—						
Buccleuch	Bushels.	Bushels.	Bushels.	Inches.	Inches.	Inches.
6·20	8·11	8·14	13·96	17·47	23·28	
Buckingham	9·08	11·54	9·07	18·80	16·88	23·23
Cardwell	—	5·80	6·39	16·16	17·72	24·95
Chandos	7·09	12·12	13·02	14·68	16·59	18·30
Grey	17·03	17·48	15·47	27·05	28·16	38·12
MacDonnell	12·80	11·59	9·39	20·97	18·97	27·40
Robe	8·71	12·59	10·68	22·29	22·80	30·06
Russell	6·62	8·48	9·58	12·82	15·67	20·79
Total	8·27	11·04	11·18	18·34	19·28	25·77
Increase	—	—	·14	—	—	6·49
Decrease	—	—	—	—	—	—
V. WESTERN—						
Buxton	—	—	—	—	—	—
Dufferin	3·85	6·36	8·82	10·22	11·33	11·90
Flinders	8·04	8·74	8·03	17·22	18·16	21·64
Hopetoun	5·98	9·39	9·15	9·00	12·23	11·87
Jervois	8·85	12·01	10·90	12·02	10·17	13·96
Kintore	4·20	7·88	6·25	9·48	11·99	12·52
Le Hunte	—	—	9·31	—	—	15·30
Manchester	—	14·00	8·33	8·48	11·68	9·88
Musgrave	8·95	8·75	8·90	14·36	16·35	19·60
Robinson	7·00	7·76	8·85	12·96	13·06	17·69
Way	4·93	7·66	8·25	12·74	10·13	14·29
York	—	—	—	10·87	14·46	10·46
Total	6·91	8·91	8·86	11·74	12·96	14·46
Increase	—	—	—	—	—	1·50
Decrease	—	—	·05	—	—	—
SUMMARY.						
I. CENTRAL	11·76	12·05	14·21	15·67	18·10	21·75
II. LOWER NORTH	13·84	13·71	16·45	13·70	16·86	14·85
III. UPPER NORTH	9·17	9·03	11·05	11·66	13·33	11·43
IV. SOUTH-EASTERN	8·27	11·04	11·18	18·34	19·28	25·77
V. WESTERN	6·91	8·91	8·86	11·74	12·96	14·46
GRAND TOTAL	11·06	11·45	13·26	14·22	16·11	17·65
Increase	—	—	1·81	—	—	1·54
Decrease	—	—	—	—	—	—

FEEDING-OFF EXPERIMENTS.

By W.M. ANGUS, B.Sc., Director of Agriculture.

In the districts south of Adelaide, where the conditions are such as to permit of a rotation of crops, the question of growing fodder crops for feeding to stock is receiving a fair amount of attention. Hitherto all attempts to establish artificial grasses on pasture land on anything like a large scale have, with perhaps few exceptions, failed, and the attention of the producer has been turned to the more common crops of peas, barley, rye, rape, &c.

With the view of testing the relative merits of some of these crops, the Department of Agriculture arranged with Mr. T. Pengilly, of Aldinga, to carry out a few experiments on his farm. Plots of two acres each were laid down and sown with barley, rye, rape, and a mixture of rye and rape respectively, the whole being manured at the rate of 1½cwt. of bone super. per acre.

During the season 1908-9, 166 sheep were pastured on the barley plot for an aggregate of 18 days, which works out at the rate of 4·1 sheep per acre per year; the rye plot carried the same number of sheep for a period of 21 days, or 4·8 sheep per acre per year; rape carried 166 sheep for 25 days, or 5·7 per acre per year; and the mixture of rye and rape carried 166 sheep for 22 days, or at the rate of 5 sheep per acre per year. It will be seen that rape easily leads the way, while there is but little to choose between the mixture of rye and rape and rape alone.

During the last season the barley plot carried 150 sheep for 20 days; the rye plot the same number for 21 days; rape 150 sheep for 18 days; and the mixture of rye and rape 150 sheep for 19 days, or at the rate of 4·1, 4·3, 3·7, and 4·0 sheep per acre per year respectively. The barley plot, therefore, was equal in carrying capacity to the same plot the previous season, but after being fed down it was allowed to mature, and yielded at the rate of 8½bush. per acre last harvest. The rye plot was not quite equal to the previous year, but when we come to the rape and mixture of rye and rape the falling off is considerable, the rape plot carrying two sheep less per acre per annum. Last season, however, the rape made but little headway, due probably to heavy frosts and excessive wet during the winter season.

It would be interesting for purposes of comparison to ascertain the average weight gained by the sheep in addition to the number of days grazed on the

respective plots, but owing to the absence of sufficient facilities this matter could not be taken in hand.

The following table shows at a glance the results of the experiment for the two seasons :—

Plot.	Crop.	No. of Days Grazed.	Sheep per Acre for Days grazed.	Size of Plots.	Equivalent Sheep to the Acre per Year.
<i>Season 1908-9.</i>					
1	Barley	18	166	2	4·1
2	Rye.....	21	166	2	4·8
3	Rape.....	25	166	2	5·7
4	Rye and rape	22	166	2	5·0
<i>Season 1909-10.</i>					
1	Barley	20	150	2	4·1
2	Rye.....	21	150	2	4·3
3	Rape.....	18	150	2	3·7
4	Rye and rape	19	150	2	4·0



ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the above was held on Wednesday, June 8th, there being present Messrs. J. W. Sandford (Chairman), C. J. Valentine, G. R. Laffer, R. J. Needham, C. Willcox, Col. Rowell, and W. J. Colebatch.

A report was received from the Dairy Expert in reference to the manufacture of cream that had become heated into butter containing a low percentage of moisture. It was decided to ask for further information on this subject.

The Secretary reported that, in accordance with the rules, the term of membership of Messrs. J. W. Sandford, G. R. Laffer, C. Willecox, C. J. Valentine, J. Miller, and C. J. Tuckwell would expire on June 30th.

Resolution from South-Eastern Conference urging the appointment of a representative of the South-East to the Board was considered, and it was decided that in submitting the same to the Hon. Minister the Secretary should point out that up to the present the members had been appointed as representing different industries and not districts.

Col. Rowell referred to the recent action of the Commonwealth authorities in proclaiming certain districts in South Australia as a quarantine area, and prohibiting the removal therefrom of potatoes, tomatoes, and other plants of the *Solanum* family. This would cause considerable inconvenience, and he would like to know whether it had been done at the request of the department. The Secretary stated that the proclamation had been issued at the request of the State Government on the recommendation of the Inspector of Fruit. This was done because our Vine, Fruit, and Vegetable Protection Act gave the Government no power to apply any regulations or restrictions to a portion of the State, and it was therefore necessary to take advantage of the Quarantine Act to prevent potatoes from infected districts going into the potato districts of the South-East. Mr. Laffer said the position was that our Act was the first in Australia dealing with this subject, but it was now out of date. In the past a section of the producers had always opposed any alterations giving the department wider powers, with the result that the Government had in this case to ask the Commonwealth authorities to step in.

The following gentlemen were approved as members of the undermentioned Branches :—Messrs. F. T. Mildren, Mundoora ; W. Kelley, Petina ; D. Menzie, Clare ; J. I. Lockhead and A. H. Fidge, Coonalpyn ; L. Riordan, J. McAuley, jun., W. Lindo, J. Smythe, and G. Harris, Cradock ; A. Howell, J. Doudle, A. C. Brice, W. Head, J. Sampson, and C. Sampson, Mitchell ; F. Baum, Waikerie ; H. and R. Whitfield, and P. Purdie, Forster ; A. McLean, H. Heinzel, and F. Threadgold, Parrakie ; F. Hill, Meningie ; M. King and G. Earl, Carrieton ; R. E. Gale, Inkerman ; J. B. Thiele, Sutherlands ; H. Dannell, Johnsburg ; W. Keatley, Yongala ; H. Roberts, Morchard ; E. J. R. Woolcock, S. Hammatt, W. Trager, Lyndoch ; J. Naughton and A. Barber, Utera Plains ; A. R. S. Ramsey, T. Jacobs, and F. F. Alne, Mitalie ; J. J. Faulkner, Whyte-Yarcowie ; L. Stapledon, P. Kilsby, and M. McDonald, Penola ; J. Harford and H. D. Clare, Murray Bridge ; W. Atkinson and G. Gill, Willunga ; W. King, Woodside ; G. H. Mann, Mannum.

FAIR AVERAGE QUALITY WHEAT.

AN INTER-STATE COMPARISON.

SOUTH AUSTRALIAN PRODUCT HIGHLY APPRECIATED.

An exhibit is now on view at the Sydney Royal Exchange of considerable interest to wheatgrowers and those connected with the trade. It consists (says the *Sydney Morning Herald*) of graded samples of New South Wales, Victorian, and South Australian f.a.q. wheats, prepared by Mr. T. B. Guthrie, of the Department of Agriculture, the samples having been collected by the Chamber of Commerce. The exhibit may be inspected by anyone interested, and is certainly worth inspection. It is another of those simple object lessons prepared by Mr. Guthrie, which tell a plain story in a plain way to the wheat-grower, and it is to be hoped he will not fail to read it. It is not a complimentary comparison to New South Wales; hence its value, for it shows that farmers are growing far too great a proportion of rubbish, and that is not a wise practice.

Samples of f.a.q. wheats having been obtained from the other States and locally, they have been graded to show the different proportions of different sized grain, broken and pinched grain, and rubbish. These results have been placed in glass jars and put in three rows for the different States, side by side. Comparisons of results can be made at a glance, and the first thing noticed is the much greater proportion of heavy, large grain in the South Australian sample, and the less quantity, though not to the same degree, of oats, whiteheads, &c., as compared with the other two samples. South Australia scores easily, as will be seen from the following details of the grading:—

	N.S.W.	S.A.	Vic.
	lbs. ozs.	lbs. ozs.	lbs. ozs.
Oats, whiteheads, &c.	0 15	0 11	0 13
Broken and pinched grain	2 3	1 7	2 3
2.00 M.M. grade	4 13	3 12	4 1
2.25 M.M. grade	18 12	14 6	20 3
2.50 M.M. grade	19 8	17 4	21 15
2.75 M.M. grade	11 9	14 0	10 15
3.00 M.M. grade	3 7	9 2	2 4
3.25 M.M. grade	0 13	1 14	0 2
	62 0	62 8	62 8

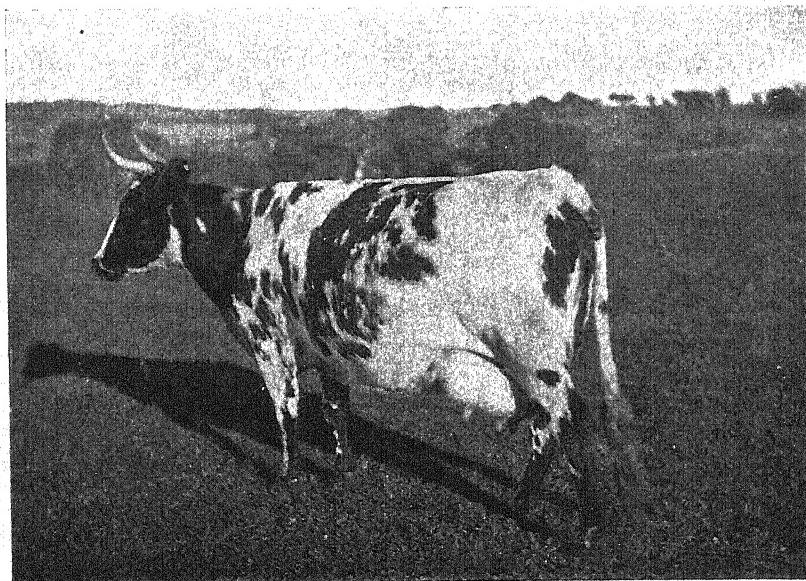
It will be seen that in the South Australian wheat the proportion of largest grains, 3·25 M.M. grade, is 1lb. 1 $\frac{1}{2}$ ozs. as against New South Wales 13ozs., Victoria 2ozs. In the proportion of the oats, whiteheads, &c., the comparison runs—New South Wales, 15ozs.; South Australia, 11ozs.; and Victoria, 13ozs. In the three middle grades New South Wales and Victoria run closely together; South Australia being less, of course, as it gains largely in the heaviest grades. It is interesting to note that, deducting the proportion of white oats, &c., and broken and pinched grain, the results are—New South Wales, 58lbs. 1 $\frac{1}{2}$ ozs.; Victoria, 59lbs. 4ozs.; and South Australia, 60lbs. 6ozs.

Bottles showing the flour, pollard, and bran produced from the wheats are also exhibited, and the following is the agricultural chemist's report:—“Appearance of grain—New South Wales, dull, white, soft, plump, fair size; South Australia, dull, white, large, soft, bunt; Victoria, dull, white, soft, plump, medium size. Weight per bushel—New South Wales, 62lbs.; South Australia, 62 $\frac{1}{2}$ lbs. Victoria, 62 $\frac{1}{2}$ lbs. Flour—New South Wales, 70·1 per cent.; South Australia, 71·6 per cent.; Victoria, 71·1 per cent. Pollard—New South Wales, 15·6 per cent.; South Australia, 12·9 per cent.; Victoria, 14·9 per cent. Bran—New South Wales, 14·3 per cent.; South Australia, 15·5 per cent.; Victoria, 14 per cent. Strength of flour in quarts per sack of 200lbs.—New South Wales, 48; South Australia, 47·2; Victoria, 46. Dry gluten—New South Wales, 10·4 per cent.; South Australia, 10 per cent.; Victoria, 10·47 per cent. Color—New South Wales, excellent; South Australia, very good, rather white; Victoria, excellent.”

One compensating fact from a local standpoint is found in the analysis of the flour, as New South Wales flour is the strongest of the three. Mr. Guthrie has made the following note on the flours:—“The color of the flour of the Victorian sample was the best, New South Wales coming second in this respect. The South Australian flour was rather white and starchy in appearance. The New South Wales sample gives rather a stronger flour than the others, the Victorian being the weakest.”

There can be no question of the value of this exhibit. These 24 jars at the Royal Exchange with their contents tell the same story as is only too often to be read in the wheat paddocks of New South Wales, where a South Australian is found alongside some of old type wheatgrowers. It is a story of better farming methods, and consequently better results. And there is no reason why this should be. With superior methods the South Australian, according to these glass jars, is getting more big grains and less rubbish, as stated, in his bushel of wheat than New South Wales growers are, and, although that is not a great matter for surprise, it is none the less dispiriting, in view of the efforts being made to encourage better farming in New South Wales. It is intended to show this exhibit to the Farmers' and Settlers'

Conference next month, and this should certainly be done for the enlightenment of delegates from the wheat centres. It should be instructive and effective. A wheat-growing conference is also to be held after the Farmers' and Settlers' Conference has finished its business paper, and these glass jars should again be strongly in evidence. They should be placed in a prominent position indeed, and be of great assistance to the deliberations of those assembled. The conference is to consider methods to improve wheat-growing, and one aim should certainly be to diminish the contrasts in this exhibit in the future. It is well worth a strong effort.



"BLUE RIBBON OF TURRETFIELD."

AGRICULTURAL BUREAU CONFERENCE.

UPPER NORTHERN BRANCHES.

The Conference of Upper Northern Branches which, prior to the drought of some years ago, was held annually, has been resuscitated owing to the energy of the Coomooro Branch and the hearty co-operation of Branches in the Upper North district.

Delegates met on Wednesday, June 22nd, in the Orroroo Town Hall, the following being present :—Orroroo, Messrs. W. Robertson and T. Tapscott ; Coomooro, Messrs. J. T. Kildea, C. Brice, E. Berryman, J. Brown; E. Brice, M. Robertson, E. Hall, H. Ward, H. and L. Avery, and H. White ; Mochard, Messrs. J. Scriven, E. J. Kitto, B. and J. McDougall ; Amyton, Messrs. W. Gum, J. Donoghue ; Wilmington, Messrs. J. J. Schuppan, J. Hosking ; Quorn, Messrs. R. Thompson, J. Patterson ; Arden Vale, Messrs. M. Echart, H. Klinberg ; Johnsburg, Mr. A. Brook ; Davenport, Mr. Bothwell ; Carrington, Messrs. J. Gleeson, W. J. Brock. There were also present Messrs. C. J. Tuckwell (Member Advisory Board of Agriculture), W. L. Summers (Secretary), A. E. V. Richardson, B.A., B.Sc. (Assistant Director of Agriculture), J. F. McEachran (Government Veterinary Surgeon), D. F. Laurie (Poultry Expert), P. H. Suter (Dairy Expert), S. McIntosh (Manager of Irrigation Works, River Murray and Orroroo), and a number of visitors.

The Hon. A. R. Addison, who presided, congratulated those responsible upon the large attendance of those directly interested in agricultural pursuits. The importance of Bureau Conferences could not be over-estimated. Farming had been revolutionised by the adoption of more scientific methods and the application of fertilisers, and he believed equally great advances were to be made as the result of irrigation and intense culture. They were much indebted to the Government for the water scheme which had made possible the irrigation of the blocks on the plain ; and the success of the experiment now depended upon the ability and diligence of those who had taken them up. Personally, he was of opinion that for them sprinkling would prove more satisfactory than flooding. By that method of irrigating such careful grading of the land was unnecessary and less water was required. He regretted that at the last moment pressing matters of business had prevented the Hon. Minister of Agriculture from attending the Conference.

Mr. W. L. Summers said the Hon. Minister had asked him to apologise for his absence. The Hon. Minister, since he had assumed office, had taken

very considerable interest in agricultural matters, and had put off other engagements in order to be present at this Conference; but two or three matters which had to be dealt with by the Government had made it impossible for him to leave the city. Mr. G. R. Laffer, of the Advisory Board, had also been prevented from coming at the last moment.

PREPARATION OF SEED WHEAT.

Mr. Kitto, of the Morchard Branch, read the following paper on "The Preparation of Seed Wheat":—

"The preparation of seed wheat is a matter of very great importance, and should receive the best attention that farmers can give it. It is just as necessary to have well-prepared seed as it is to have a well-prepared seed bed. It is bad policy to work the land up to a good tilth for a crop and then plant inferior seed."

CLEAN RIPE SEED.

"In order to obtain the best results in the first place it is necessary to leave all wheat that is intended for seed to get ripe before it is reaped; the grain then being well matured will be of good quality. If the stripper is available I prefer it to the harvester for taking off the seed. The grain does not get knocked about so much and damaged; and also any rubbish, such as wild oats or sheep weed in the crop is not repeated back into the sample from the stripper and cleaner, as is done with the harvester. In the cleaning all wheat from headings, &c., should be kept apart from the seed. If the harvester is used the machinery should all be set so that it will work at slow speed. This will allow the grain to be more lightly dealt with."

GRADING.

"I am a strong believer in grading seed. This is of very great importance for both yield and improvement of the sample. I have known farmers to buy small wheat for the purpose of sowing: this is not economy. While a bushel of small seed will plant more land than a bushel of large seed, it is not reasonable to expect that a small grain will produce such a strong, robust plant as the large grain. The young plant has to depend on the mother grain until it is thoroughly established in the soil; in fact, the plant is receiving maintenance from the grain as long as the grain has anything to give."

CHANGE OF SEED.

"If wheat is continuously grown on the same land and under the same conditions it will degenerate, and will yield only poor returns of inferior quality, although it may have been a good class of wheat in its earlier history. Wheat that contains a big percentage of small grains, although it has been grown under favorable climatic influences, is in a state of degeneration.

If the seed is carefully graded it will help very much to avoid this degenerating, by breeding out all the small wheat. To emphasise this, we do not see a poultry-breeder select small eggs to hatch his chicks : he would take the large eggs. Neither do horsebreeders expect to get Clydesdale colts from blood parents ; and what applies to animal life here also applies to plant life. I have been grading seed for several years, and can honestly say that by so doing there is a less percentage of small wheat in the resulting crops. The broken grain is also taken out by the grader. If the grain is broken crossways and the germ end planted it will grow ; but it will only help to increase the percentage of weak plants. After all, what is taken out by grading is just as good for fodder as the best. The cross fertilisation of wheats is of great benefit in bringing out new kinds of robust quality and good yielders ; but this cannot be undertaken by the ordinary farmer. What I advise is that all wheatgrowers should plant only the best of seed and change it as often as possible. Seed should not be planted on the same farm for a longer period than three years in succession, and two years would be better than three. But the trouble seems to be to get good seed. This should not be the case. It is a good plan if one has a good class of wheat and it has served its time on the farm, say, two or three years at the outside, to send it right away to a fresh district for a change, care being taken to place it in the hands of careful farmers who take an interest in the upkeep of the seed. After it has been grown two or three years there bring it back again. A lot can be done in this way to keep up the change of seed.

PICKLING.

"I have heard some farmers say they can grow crops clean from smut without pickling the seed. I have often tried this on small plots, such as finishing off a paddock, and in my case it has always proved a failure. Of the several ways of pickling I generally use the cask and dip half a bag at a time. Have the mouth of the bag open ; then stir up the wheat with a flat stick or piece of board ; then skim off all rubbish that floats on top of the pickle. If there are any smut balls in the seed most of them will come to the top and can be taken out. I use $\frac{1}{2}$ lb. bluestone to 4bush. of seed. Some kinds of wheat are more subject to smut than others. If I have to sow seed that is at all smutty I use stronger pickle, sometimes as much as 1lb. of bluestone to a 4bush. bag. Strong pickle is all right if the soil is wet and the seed can start at once, but if the seed has to lie in the land for very long it is risky to have the pickle too strong. All pickling retards the germination of the grain to some extent, and also the growth of the young plant in its early stages. Here, I consider, is a good opportunity for scientific men to find some treatment for the seed that will not injure it, but yet deal effectively with the smut. Such a pickle would be a boon to the wheatgrowers,

and the inventor would be a benefactor. I think it ought to be the aim of all farmers to pay the greatest attention to the seed they plant by grading, etc., and so breed out all small and inferior samples. Science has done a lot in this direction, and farmers should now help science and help themselves."

Mr. McIntosh considered both grading and change of seed very important matters. A great deal, however, depended upon what part the fresh seed was procured from. His father had procured seed which took five years before it yielded properly, and by which time other wheats procured at the same time had begun to degenerate. He would like to know what kind of change Mr. Kitto would advocate. Mr. Kitto said that any change was of benefit, but it was best to secure seed from a drier district. Others agreed with this opinion.

Mr. McDougall (Morchard) had procured seed from saltbush country 40 miles from his farm. The sample was not quite pure, but it yielded splendidly for several years; in fact, the first year sown a good crop was reaped from the new variety, while those wheats which had been grown on the farm for years returned nothing.

Mr. Richardson agreed that the harvester turned out a sample of wheat which was inferior to that taken off with the stripper, and that small seed was usually productive of small grain in the crop. A point not touched upon, however, was the fact that in the past many farmers used to sell the good wheat and keep any inferior grain for seed. This had undoubtedly been responsible for the deterioration of wheat. If an effective grader could be procured which would do the work cheaply it would be a great help. Bluestone as a pickle interfered very seriously with germination. If a man sowed a bushel of seed to the acre, not more than three-quarters of it germinated if treated with bluestone. Germination was also delayed. Two other fungicides seemed to give promise, provided they were used carefully. Formalin was good, but it was difficult to obtain the pure article. Fungusine was spoken of very highly in the other States, but experiments in this State had not been conducted long enough to speak very positively of it. It was worth trying, nevertheless. A change of seed from a suitable district was good. If possible seed should be taken to a wetter district than that from which it came, and should be purchased from a farmer whose methods of cultivation were known to be good.

Mr. Gleeson (Carrieton) preferred to pickle on a cement floor. All seed was winnowed twice to get it as clean as possible. It had been found by members of his Branch that wheat germinated more quickly when pickled with formalin, and they were of opinion that this pickle would ultimately take the place of bluestone. Some farmers greatly increased the strength of the pickle if the seed was very smutty. This was a mistake, as it destroyed the germination of a large percentage sown. Careful change of seed was

beneficial, but unless sure of the source from which it came, and that it would be pure, a man was liable to get a very mixed crop.

Mr. Summers said that, while judicious change of seed was of value, he thought not sufficient attention was paid to selection. A number of experiments had been carried out by American agricultural authorities, and in those tests better results were generally obtained from selected seed than from seed brought from another place. So far not much had been done by the department in South Australia in selecting wheat, except at Roseworthy College. The value of a change of seed also depended upon the soil from which and to which the change was made. In this district possibly a wheat which would grow in cold weather would do better than one from a dry, mild climate. He would like to see some experiments conducted with change of seed *versus* selection. Referring to graded seed, he said it germinated much more regularly than ungraded, and grew more evenly to the finish. This alone was something worth grading for.

Mr. Hosking (Wilmington) had purchased, two years ago, two bags of graded Federation from Roseworthy, and delivered at Quorn it cost 6s. 9d. per bushel. It was beautiful wheat, but the first year only yielded 7bush. per acre, while his own wheat returned 15bush. He tried it again and reaped 36bush. per acre of screened wheat. He therefore came to the conclusion that wheats from the south must become acclimatised before they would yield properly, and that they should not be condemned until well tried. In 28 years' wheat-growing he had not been docked a half-penny for smutty wheat. He pickled on a floor, and turned the wheat four times. Those people who said crops from pickled seed had smut in them, and those from seed not pickled were clean, were talking nonsense. The so-called pickled seed had not been thoroughly wetted. He always used a hot solution for pickling.

Mr. Schuppan (Wilmington) was never troubled by smut. He pickled on the floor. One person sprinkled the pickle on, and two shovelled the grain. He had now constructed a large flat case with sides a foot high for pickling in. He had a grader, and thoroughly believed in using it. It was adjustable for different sizes of grain, and did its work well.

Mr. Suter had reaped an average of from 11bush. to 12bush. from ungraded seed one year, and an average of 21bush. to 22bush. per acre from graded seed another year. He could not say how much the yields were affected by the difference in the seasons. When discussing the question of the value of graded seed it was absurd to compare results of different seasons.

COMMERCIAL POULTRY-BREEDING AND EGG CIRCLES.

The Poultry Expert (Mr. D. F. Laurie) delivered an address upon poultry-breeding and egg circles. Five years ago, he said, he was told that fowls would not thrive in this district and that White Leghorns would not live

here. To-day it was recognised that the districts represented by delegates present were equal to any in the State for the production of both eggs and table poultry. He must say, however, that the average farmer did not pay enough attention to the proper sheltering of his poultry. If fowls were exposed to the weather a great deal of the food they consumed only served to keep up the animal warmth instead of the production of eggs. The drought years had passed, and farmers could now afford to erect proper fowlhouses. Old places made of timber were prolific tick producers, and should be replaced by a style of house in which it was practically impossible for tick to find shelter. If fowls were not given egg-producing food they could not lay. It was not sufficient to give them wheat only. Unless the diet was varied with bran, pollard, and meat foods, such as boiled rabbits, pluck, or meat meal, the egg supply would decrease. This was a splendid district for turkeys, and he was surprised that more people did not go in for their production. It was, of course, necessary to protect them from the foxes, but this was well worth while when they would bring 7d. per pound to the producer.

Egg Circles.—Since the commencement of the egg-circle movement, about 12 months ago, 36 circles had been formed, with a membership of 800 or 900, bringing in a large number of first-class eggs. The result had been better eggs, better market, and members received cash value for the eggs instead of having to take the value in provisions, &c. The conditions and management of the egg circles were then described and mention made of some of the markets served. New South Wales, Victoria, and Western Australia were taking casks of graded eggs, with clean shells, fresh contents, and each guaranteed to weigh not less than 2ozs. There was a big demand, and the price per dozen was 1d. over the rate ruling for other eggs. This was the outcome of organised co-operation; but it was to be regretted that so many people hung back until they saw what the outcome was to be. The same thing happened when eggs were first sent to the English market from here. Although every egg producer gained by the enhanced prices resulting from the shipment of a surplus very few did anything in the way of co-operating to earn it. The effect of the Government having opened up the English market was an average price of 11d. per dozen for eggs last year, and it had also been proved now that shipments to England would give the producer here 7½d. a dozen as a minimum. The eastern States therefore had to pay the same price. To get the best results from this movement more circles would have to be formed, so that business could be conducted on a still larger scale. He hoped every Branch of the Agricultural Bureau would consider the question of forming a circle. The value of any system which would ensure eggs being gathered when fresh could be seen from the fact that a firm at Balaklava found it necessary to set apart £500 or £600 per annum for rotten eggs. In reply to a question as to what aged birds to breed from, Mr. Laurie said it was the practice to breed from only those hens whose laying powers had

been proved. They were, necessarily, at least 12 months old. If, say, a White Leghorn had laid over 200 eggs in the year it would be worth while breeding from her, but if she had only laid 160 or 170 it would not be advisable. Breeding from pullets had a tendency to decrease the size of the eggs. In answer to other questions, Mr. Laurie said the way to get rid of tick was to have houses with as little wood in them as possible, and spray houses, yards, and any places where tick might be with kerosine emulsion—1gall. of kerosine to 10galls. soapy water. If necessary fowls could be dipped in this mixture, or in a solution of formalin or sheep dip. Lucerne was a valuable addition to the fowls' food, either green or chaffed. It should be cut just before the buds were forming. He would advise the use of one-third by measure of this feed in the mash; it was cheaper than bran or pollard. The treatment for crop impaction was to open the outer skin and then the crop itself, and empty the latter with the handle of a silver spoon. Wash out the crop with bicarbonate of soda (baking soda) and water, and put two or three stitches in the crop and the outer cut and it would quickly heal.

DRY FARMING.

Mr. A. E. V. Richardson inaugurated the evening session with an educative and lucidly convincing address on "Dry Farming." The only difference between Campbell's system and the methods of fallowing adopted by the farmers in South Australia was that Campbell used the forces of nature in a different way. The Surveyor-General (Mr. Strawbridge) and Sr. McColl, on their return to Australia from the United States, had both expressed strong belief in dry farming, and the latter had stated that the application of the system to Australian agriculture would probably result in a great addition to the quantity of wheat produced. The late Minister of Agriculture (Hon. T. Pascoe, M.L.C.) had spoken repeatedly in favor of dry farming, and just prior to leaving office had shown his great interest in it by completing arrangements for the establishment of a dry farm of about 4,000 acres some 40 miles north of Petersburg. What they had to consider were: What were the underlying principles of dry farming; how the American system referred to differed from that pursued in South Australia; and how far dry farming could be practised in connection with Australian agriculture. The fundamental consideration was the question of the conservation of soil moisture. That was the paramount object of dry farming—to utilise as fully as possible all the rain which fell. Another matter was the development of the root system of the plant and the development in the soil of the maximum amount of fertility. In moisture conservation the first essential was to get the water into the soil. Campbell achieved this by the use of the double disc—an implement consisting of two series of revolving discs set at a slight angle to one another, and placed tandem fashion. This double disc covered the soil with a loose soil mulch, so that when rain

fell it would be able to penetrate easily, and at the same time the moisture already present in the soil would be conserved. The capacity of a soil for holding moisture was dependent partly on its physical constitution, e.g., the amount of clay, sand, lime, gravel, or organic matter it contained; and also on the fineness of subdivision of the soil particles. Organic matter considerably improved the native capacity of a soil for holding moisture, and that was one important reason why the introduction of organic matter into the soil was so strongly advocated. The finer the soil particles were pulverised the more effectively would the soil hold moisture. With the aid of graduated tubes containing coarse and fine shot the speaker forcefully demonstrated the logic of his remarks.

Campbell's Methods.—Other essentials were to enable the moisture to move freely, and so properly supply the demands of the plants; to keep the soil in a good capillary condition; and to keep the surface loose, so that evaporation would be reduced and the moisture thus retained. Campbell's system of dry farming differed from the methods favored in South Australia in four fundamental respects. (1) He advocated the use of the double disc; (2) a far more vigorous plan of cultivation; (3) he introduced a new idea in the shape of the subpacker; and (4) he utilised the physical laws of plant-growth in a more intelligent manner than the South Australian farmers. Campbell followed the harvester with the double disc to allow the ensuing rain to penetrate the soil. What could be done in South Australia was to put the double disc through the land before the rains in the autumn, when the same result would be secured. Campbell believed in ploughing deeply. The average depth of soil cultivation in South Australia was not far off 3½ in.; seldom did a farmer go deeper than 4 in. or 5 in., and 6 in. was quite a rarity. There were cases in which it would never pay to plough deeply—where the subsoil came near to the surface, or there was gravel or unseasoned clay. But he did not think there was a farm in the State that did not possess a small area of deep soil. It was worth remembering that by ploughing an inch deeper they would break up 200 additional tons of soil particles to the acre, place them at the disposal of the coming crop, and they would help to conserve the moisture.

Value of Deep Cultivation.—As showing the value of deep cultivation, Mr. Griffin, at Hammond, in 1908, secured 23 bush. to the acre from land which he had ploughed 6 in. deep, and only 17 bush. from land that had been ploughed 4 in. In the following year he reaped 19 bush. and 14 bush. respectively. Apart from the different depths of ploughing, all the land was treated in a similar manner. An increase of 6 bush. an acre at 4s. a bushel was surely worth ploughing two extra inches. He regretted that no tests of deep and shallow ploughing had ever been carried out in the State on definite lines. What the farmers had to bear in mind was not the first crop after the deep ploughing, but the indirect effect. Consistent and gradual deep cultivation over a period of years would improve the pasture immensely. Deep ploughing

had not proved profitable in some parts for one of two reasons, or possibly both. For years they had been impoverishing the subsoil, and when the commercial fertilisers came into use they were merely placed on the top. The other reason was the non-consolidation of the seed bed. Proper consolidation eliminated all the large air spaces and gave a firm, pulverised seed bed. Campbell believed in following the plough with the subpacker, and immediately after that the harrows. The subpacker firmed the under portion of the furrow slice, helped to eliminate the large air spaces in the soil, and led to that degree of consolidation of the seed bed that made for maximum crops. Rolling would not give the same effect as subpacking, inasmuch as it led to the consolidation of the surface layers and promoted evaporation. The fine, firm substratum produced by subpacking enabled the soil to carry a balanced quantity of air and water, and created a physical condition of the soil eminently suited for the development of fertility. The subpacker consisted essentially of a shaft carrying a series of revolving wheels with wedge-shaped rims, which were ideally adapted for pulverising and consolidating the seed bed. At Hammond, in 1908, the increase due to subpacking was $3\frac{1}{4}$ bush., whilst in 1909, which was a drier year, the increase amounted to $4\frac{1}{2}$ bush. With wheat at 4s. a bushel this gave a margin of profit equal to 16s. per acre after deducting the cost of subpacking, which was 2s. per acre. In dry farming the question of manuring demanded careful attention. Under present conditions soluble superphosphates were the only kind likely to give profitable crops. In the dry districts it was safer to put on small dressings, as heavy dressings sometimes led to a sappy and rank growth. Another point of importance in dry farming was the selection of suitable seed. The variety chosen should be suitable for dry regions, and when suitable varieties had been obtained they should be steadily improved by careful systematic selection. The Surveyor-General, in his publication on dry farming, had mentioned that there were in South Australia 4,000,000 acres of first-class land, outside the line of rainfall that could be profitably utilised if it could be demonstrated that agricultural operations could be conducted on a 10-in. rainfall. In answer to questions, Mr. Richardson said the Americans who practised dry farming cultivated the land as long as possible without damaging the growing plants. In order to minimise the damage to growing plants the teeth of the harrows were sometimes slightly turned backwards. The soils most suitable for dry farming were of a light, loamy character.

PARTURITION.

The Government Veterinary Surgeon (Mr. J. F. McEachran) delivered an address on "Foaling and Calving." So far as he was aware no statistics were kept in this State of the mortality among foals and calves, and among mares and cows at the time of parturition. It was well known, however, that a considerable number of animals were lost, some of them owing to

want of knowledge on the part of owners. It was important that farmers in districts where veterinary advice could not be procured should receive from the State veterinary officers as much information as possible. Lantern views were then shown, and as the slides passed Mr. McEachran gave a description of the proper course to be followed in various conditions which might be contingent upon foaling and calving. He also described the various hereditary diseases in horses, including ringbone, sidebone, bog spavin, thorough pin, curb, &c. In closing he appealed to the farmers to assist the Government in eradicating hereditary unsoundness from the horse stock of the State by refraining from breeding from stallions and mares affected by the hereditary diseases referred to.

BEAUTIFYING THE HOMESTEAD.

Mr. J. Schuppan (Wilmington) read a paper under this title.

He considered that every farmer should do his best to make his home sightly and comfortable. One of the greatest factors in a nice homestead was the garden round the house. Everyone was ready to bestow words of praise when a home with a garden of flowers or green shrubs was met with. Not only was the cash value of a property improved by planting trees and other ornamental vegetation, but the place was made more really a home, and was prevented from becoming a mere lodging-place. Little considerations such as this, and the erection of verandahs to keep the worst of the heat and wet from playing directly on the walls of the property, made life comfortable and pleasant, while neglect of such details tended to make it simply an existence. The higher senses were catered for by that which was beautiful in flowers, trees, and shrubs. Good fences were needed to protect gardens from the depredations of stock, and a certain amount of attention to the growing plants; but it was well worth doing and should be looked upon as a necessary complement of the well-established farm. Several delegates commended Mr. Schuppan for his paper; and it was mentioned that he had improved his own property in the manner described, and, therefore, it was fitting that he should draw the attention of others to the benefits to be derived.

Mr. McEachran pointed out that such action would have a double effect, in that manure and refuse, which was unfortunately left lying in stables and yards to the detriment of all kinds of stock, would be transferred to the garden, there to enrich the soil.

Mr. Gleeson, while fully alive to the advantages of improvements of this nature, spoke of the difficulty of maintaining gardens of any kind in those parts which were periodically visited by locusts. Many a verandah, he also said, had been riddled with white ants, but possibly this pest could be guarded against if proper precautions were taken. Mr. Thompson (Quorn) said that white ants had been absolutely kept away by spreading cheap

common salt. Another way was to put the posts in concrete. Under floors they had been kept down by putting a piece of tin on the top of posts which supported the joists. The tin projected over all sides and the ants were unable to get above it.

HORSE FEEDER.

Mr. Thompson (Quorn) described the way in which he had constructed a cheap and effective horse feeder with sheets of corrugated galvanized iron. The dust from the chaff settled in the hollows or corrugations and could be cleaned out with a damp bag. Mr. McEachran said that, from a practical and veterinary standpoint, he could not at all agree with that style of feeder. He thought that there was great danger of the cleaning out being neglected, and that even if attempted it would not be an easy matter. If made of smooth iron, with a flush-hole at one end so that it could be washed out, it would be much healthier and more satisfactory. Other speakers agreed that the smooth iron was best for this purpose.

FEEDING AND CARE OF DAIRY COWS.

The Dairy Expert (Mr. P. H. Suter) addressed the meeting on this subject. Since dairying had been taken up in this district it had become evident that it was a part eminently suited to that pursuit. Monetary returns were derived more rapidly from the dairy cow than from any other rural industry, and the dairyman had to depend upon his judgment in buying cows in order to secure the true dairy type. It was no use to try to make a beef cow into a dairy cow, and he therefore described at some length the characteristics to be looked for in selecting animals for milk and butter production. Having procured the cow it was necessary to recognise that an animal producing up to 700galls. of milk per annum, including about 700lbs. of solids, such as butter and cheese, must be fed in a rational manner. A certain knowledge of the value of foodstuffs was therefore indispensable. Certain foods were rich in heat and energy supplying material, and others in that which went to make bone, muscle, and milk. He was strongly of opinion that a great number of cases of cattle complaints attributed to dry bible were really caused by lack of proper nutrient and change of food. Straw was as necessary to a milch cow as bran. Bran was rich, but it lacked bulk. Straw with bran, beans, peas, and other legumes made excellent food. Good lucerne was almost as good as bran, pound for pound, in food value. He was at present feeding his seconds and thirds of wheat to his cows at Turretfield to take the place of bran, and it paid to do this while high prices ruled for the latter fodder. It was a good plan to sow some leguminous crop with the hay, and so lessen the quantity of bran required. Of all fodders, however, natural grass where obtainable was the best balanced ration. Salt was needed by cows in small quantities—it was to them an appetiser and an aid to digestion. If a cow was placed in uncomfortable surroundings it would quickly reduce the milk

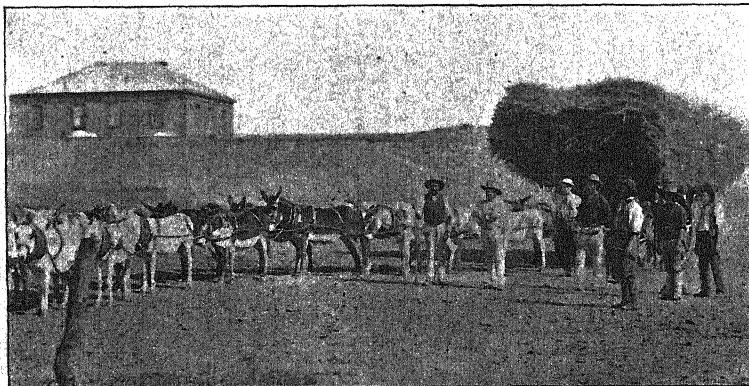
supply, and stagnant water would affect its flavor. Mr. Suter then illustrated by means of sketches on a blackboard the different parts of the udder, showing the means by which a cow could control her milk and refuse to give it down if upset by rough treatment. In answer to a question, he said that it was not wise to over feed dairy calves, as if they developed the habit of flesh-producing they would probably not be such good milkers when grown. Speaking of the relative value of certain foods, molasses, he said, while useful for feeding purposes, was not strictly speaking a milk producer. Copra cake, oil cakes, &c., were of more value to the milch cow than molasses. In a most exhaustive test of food values conducted in New South Wales it had been found that cows fed on copra cake gave butter of a very high melting point, while the butter from cows fed on ensilage secured the highest place of all for its excellent quality. Replying to a question as to spaying, Mr. Suter said unprofitable cows, old or young, and rough heifers, could with advantage be spayed and sent to the butcher as soon as they were no longer worth keeping. If well fed a spayed cow might give a payable quantity of milk for three or four years.

HYBRIDISING WHEAT.

At the request of the meeting Mr. Richardson explained the method and procedure of hybridising wheat, and illustrated his remarks by sketches on the blackboard.

NEXT CONFERENCE.

It was unanimously decided to hold the next conference of Upper North Branches at Quorn in February or March next. A vote of thanks to the Chairman and to the officers of the Coomooro Branch who had organised the Conference terminated the proceedings.



A TEAM OF DONKEYS IN THE FAR NORTH.

RAINFALL TABLE.

The following table shows the rainfall for June, 1910, at the undermentioned stations, also the average total rainfall for the first six months in the year, and the total for the six months of 1910 and 1909 respectively:—

Station.	For June, 1910.	Avg. to end June.	To end June, 1910.	To end June, 1909.	Station.	For June, 1910.	Avg. to end June.	To end June, 1910.	To end June, 1909.
Adelaide	3.04	10.11	11.69	11.03	Hamley Brdge	2.70	8.02	10.31	7.18
Hawker	3.68	5.83	10.16	8.83	Kapunda	3.10	9.11	11.38	10.81
Cradock	2.87	5.42	8.71	7.75	Freeling	1.80	8.39	10.52	7.87
Wilson.....	3.34	5.83	10.73	7.96	Stockwell	2.95	9.32	10.80	9.80
Gordon	2.30	8.05	5.08	8.12	Nuriootpa....	2.68	9.80	11.08	9.67
Quorn	2.72	6.37	8.77	8.87	Angaston ...	3.81	9.82	13.34	11.88
Port Augusta..	2.80	4.85	8.85	7.38	Tanunda ...	3.71	10.26	12.32	13.05
Port Germen... Port Pirie ...	2.85	6.27	10.53	7.95	Lyndoch ...	3.27	10.41	12.14	11.45
Crystal Brook	4.50	6.47	13.90	6.61	Mallala	1.88	8.24	9.97	7.37
Pt. Broughton	3.08	7.17	10.79	7.92	Roseworthy .	1.67	8.33	11.06	8.55
Bute	2.64	7.02	10.17	7.36	Gawler	3.29	9.15	11.91	10.47
Hammond	4.63	7.27	12.30	7.20	Smithfield ..	2.96	8.26	11.98	8.75
Bruce	2.19	5.22	8.70	8.47	Two Wells...	2.25	8.37	9.66	6.47
Wilmington ..	3.40	4.30	9.15	6.76	Virginia.....	2.76	8.64	10.76	8.48
Melrose	3.96	8.24	13.51	11.47	Salisbury ...	3.96	9.03	13.41	9.19
Booleroo Cntr	4.13	10.84	17.65	16.22	Teatree Gully	3.50	13.91	14.73	17.40
Wirrabara...	3.08	7.32	10.74	9.14	Magill	2.55	12.77	11.70	15.43
Appila	2.89	8.67	13.44	12.71	Mitcham ...	3.10	11.60	11.20	12.72
Laura	2.74	6.86	13.66	8.21	Crafers....	6.11	21.79	24.45	29.73
Caltowie	3.60	7.90	14.64	12.70	Clarendon...	3.12	16.13	14.25	19.64
Jamestown	2.30	7.63	10.83	8.62	Morphett Vale	2.42	11.45	11.33	12.66
Gladstone	2.37	7.59	9.34	8.39	Noarlunga...	2.01	9.84	10.05	10.81
Georgetown	2.72	7.06	10.68	7.94	Willunga....	2.64	12.22	13.94	15.04
Narridy	3.05	8.50	10.58	8.66	Aldinga....	2.01	10.11	10.69	10.97
Redhill	2.86	7.95	10.01	7.19	Normanville.	3.22	10.00	11.84	10.95
Koolunga	4.21	7.77	13.88	8.37	Yankalilia...	3.77	11.51	17.46	10.95
Carrieton	3.82	7.31	12.81	7.82	Eudunda....	3.88	7.77	14.65	7.77
Eurelia	2.55	5.52	11.67	8.47	Sutherlands ..	1.82	—	8.96	—
Johnsbury	3.12	5.99	10.56	7.91	Truro....	4.21	8.74	12.02	8.59
Terowie	2.67	4.41	9.07	7.26	Palmer....	2.52	—	10.22	7.30
Orroroo	2.53	6.59	9.16	8.27	Mt. Pleasant.	4.21	12.47	13.11	13.44
Black Rock	2.00	5.80	9.74	8.56	Blumberg ...	4.09	13.93	13.79	16.35
Petersburg	1.89	6.04	8.31	7.38	Gumeracha...	4.43	15.42	15.52	17.15
Yongala	1.99	6.23	8.29	7.28	Lobethal....	5.02	16.46	16.04	17.53
Yarcowie....	1.82	5.95	11.40	6.97	Woodside....	5.42	14.26	17.37	17.22
Hallett	2.00	6.18	11.06	7.64	Hahndorf...	4.57	16.03	29.00	17.80
Mount Bryan	1.75	7.25	8.81	7.22	Nairne....	3.61	13.27	16.99	13.92
Burra	1.98	7.01	9.88	6.68	Mt. Barker ..	3.41	13.91	16.68	13.77
Snowtown...	2.97	8.10	12.09	9.15	Echunga...	3.75	15.32	20.01	15.70
Brinkworth	3.01	7.38	10.90	8.45	Macclesfield..	3.19	13.40	18.18	15.53
Blyth	2.76	7.05	11.47	7.44	Meadows....	4.21	16.34	26.91	17.59
Clare	2.04	7.77	9.43	9.09	Strathalbyn ..	1.71	8.76	12.29	10.13
Mintaro Cartl.	3.91	11.11	15.00	12.40	Callington...	1.86	7.15	9.61	7.51
Watervale...	2.79	9.93	12.81	11.28	Langh rne's B	1.51	7.06	8.51	6.87
Auburn	2.98	12.72	13.23	13.75	Milang	1.25	8.24	6.97	9.74
Manoora	3.29	11.08	13.86	14.09	Wallaroo...	3.81	7.12	9.91	9.21
Hoyleton	2.45	8.34	10.94	7.59	Kadina....	3.09	7.94	9.75	8.82
Balaklava	2.24	8.80	8.44	7.53	Moonta....	2.35	7.81	7.84	8.99
Pt. Wakefield	2.86	7.81	9.98	6.74	Green's Plns.	3.15	7.53	9.26	11.35
Saddleworth	2.10	6.82	7.96	4.95	Maitland....	1.80	9.87	8.14	11.54
Marrabel	2.63	9.48	11.06	7.98	Ardrossan ..	1.68	6.87	7.12	8.25
Riverton	2.66	8.95	10.85	9.48	Port Victoria	2.28	7.68	7.70	9.77
Tarlee	2.59	9.64	13.96	10.04	Curramulka ..	3.28	8.82	10.42	8.39
Stockport	2.15	8.31	10.96	8.14	Minlaton....	2.92	8.48	10.29	8.17
	1.17	7.70	8.24	6.86	Stansbury...	2.99	8.07	9.42	9.18

RAINFALL TABLE—*continued.*

Station.	For June, 1910.	Av'ge. to end June.	To end June, 1910.	To end June, 1909.	Station.	For June, 1910.	Av'ge. to end June.	To end June, 1910.	To end June, 1909.
Warooka....	2.99	8.23	10.04	6.82	Bordertown .	2.54	8.96	9.56	9.68
Yorketown .	2.26	8.34	9.77	6.77	Wolseley....	2.16	8.00	9.79	9.62
Edithburgh..	2.95	8.07	10.99	7.69	Frances....	2.51	8.67	10.21	9.92
Fowler's Bay.	0.71	6.55	4.09	5.27	Naracoorte .	2.47	10.05	11.98	13.09
Streaky Bay.	1.80	7.70	6.64	7.07	Lucindale .	3.35	10.28	14.72	13.66
Port Ellioton.	1.97	8.00	6.26	7.52	Penola	3.61	11.92	15.50	14.16
Port Lincoln.	3.83	9.50	7.93	8.77	Millicent	4.01	13.77	14.77	19.74
Cowell	1.74	5.86	7.33	3.96	Mt. Gambier.	4.33	14.18	16.12	21.05
Queensclife .	5.12	18.92	16.27	8.22	Wellington ..	2.12	7.28	10.36	8.09
Port Elliot ..	2.23	9.89	9.76	7.18	Murray Bridge	2.16	6.75	12.30	8.56
Goolwa	2.75	8.47	10.01	10.30	Mannum ...	2.64	5.83	10.72	6.80
Meningie....	1.79	8.92	8.94	10.19	Morgan	1.18	4.35	6.40	3.92
Kingston....	3.72	11.70	13.92	15.47	Overland Crnr	1.69	5.44	9.60	4.74
Robe	4.70	1.45	14.20	15.26	Remark....	1.68	4.89	8.15	5.62
Beachport...	3.28	13.05	13.58	20.44	Lameroo ...	2.29	—	8.71	7.77
Coonalpyn ..	1.60	7.91	8.30	10.96					

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,500 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites.

Particulars as to charges for space on application to the Department of Agriculture, Adelaide.

DAIRY AND FARM PRODUCE MARKETS.

The Acting Manager of the Produce Export Department reports on July 4th:—

BUTTER.

Owing to the mildness of the season the supply of butter has exceeded all expectations, and is greatly in advance of the same period last year. It is satisfactory to note that all grades have kept up their usual standard of quality. Prices have eased during the month, the present values being superfine 1s. 1d. and pure creamery 1s.

Eggs.

The market during the month showed more than the usual seasonable increase in supplies, and there was a consequent easing of prices. The weather continued mild, causing the production to be well maintained. Pickled and chilled eggs which were stored, partly owing to the fact that last flush season's rates were too high to allow of profitable shipment at the time, also helped to reduce values. A development occurred during the month in the shape of market reports which were issued by the secretary of the co-operative egg circles for the first time. Circle eggs were reduced by 3d. on the ordinary market rates, and the private houses at once followed suit, so that at the close of the month the rates in Adelaide were uniform. The month began at 1s. 5d. per dozen and closed as 1s. 1½d. As the inter-State markets were weak, the bulk of the supplies were disposed of locally.

Messrs. A. W. Sandford & Co. report the following quotations on July 1st:—

FLOUR.—City brands, £8 10s. ; country, £8 5s. per ton of 2,000lbs.

BRAN.—1s. per bushel of 20lbs.

POLLARD.—1s. per bushel of 20lbs.

OATS.—Local Algerians, 2s. to 2s. 1d. per bushel of 40lbs.

BARLEY.—Cape, feed, 2s. 3d. to 2s. 6d. per bushel of 50lbs.

CHAFÉ.—£3 10s. f.o.b. Port Adelaide, per ton of 2,240lbs.

POTATOES.—Gambiers, £5 to £5 5s., on trucks, Adelaide or Port, per ton of 2,240lbs.

ONIONS.—Gambiers, £3 10s. to £3 15s., on trucks, Adelaide or Port, per ton of 2,240lbs.

BUTTER.—Best factory and creamery, fresh in prints, 1s. to 1s. 2d. ; second grade factories, 11d. to 11½d. ; choice separators, dairies, 11d. to 1s. ; medium factory, creamery, and dairies, 9d. to 10d. ; stores and collectors, 7½d. to 8½d. per lb.

CHEESE.—Factory makes, 6d. to 7d. for large to loaf per lb.

BACON.—Factory-cured sides, 7d. to 8d. ; middles, 8d. to 8½d. ; well cut and cured farm fitches and rolls, 6d. to 7d. per lb.

HAMS.—8d. to 8½d. per lb.

EGGS.—Loose, 1s. 2½d. per dozen, for prime guaranteed new-laid.

LARD.—Skins, 6d. ; tins or bulk cases, 5½d. per lb.

HONEY.—Prime clear extracted, 2½d. to 3d. ; secondary sorts, 1½d. to 2d. ; beeswax, 1s. 1½d. per lb.

ALMONDS.—(Scarce) soft shells, Brandis, 6½d. ; mixed soft shells, 6½d. ; kernels, 1s. 3d. per lb.

LIVE POULTRY.—Good table roosters, 2s. 3d. to 2s. 9d. each ; plump cockerels, 1s. 6d. to 2s. ; hens and light cockerels, 1s. 3d. to 1s. 5d. ; ducks, 2s. to 3s. ; geese, 3s. 6d. to 4s. 6d. ; pigeons, 6½d. to 7d. ; turkeys, 6d. to 8½d. per lb., live weight, for fair to good table sorts.

THE WHEAT MARKET.

We publish this month a diagram of wheat prices at Port Adelaide since 1862, which has been prepared by Mr. W. L. Johnston, Chief Clerk of the Statistical Department. A plan of this sort, showing graphically the ups and downs of the wheat market during the last 48 years, will certainly be of interest to our farmers, millers, and grain merchants. In consulting the diagram it must be remembered that it is the average price for each year which is shown, and not the highest or lowest figures reached in the market. Thus 1864—a year of strong fluctuations—began with wheat at 4s. 3d. a bushel. In June the price soared up to 11s. 4d., and towards the end of the year declined to 7s. 6d., but in November, 1865, it had risen to 12s. a bushel. When the other extreme was reached, in 1894, the market was at its weakest between October 10th and November 15th, when it stood at 2s. 0½d. per bushel, probably the lowest price ever recorded in the State.

The average of quinquennial periods shows on a still broader scale the movement of the wheat market. The steady fall from 1865 to the middle of the nineties is probably to be explained by the opening up of the Great Western Plains of North America by railways and by better transport facilities from Russia, while the gradual rise in price since 1894 is doubtless attributable to the steady increase of the world's population, especially in the United States, and the appearance of Germany as a wheat-importing country. These stimulating causes have been to some extent counterbalanced by the recent enormous extension of the wheat areas in Argentina and Canada.

During June the wheat market recovered tone somewhat in South Australia, and in the early part of July prices were from 3s. 3d. to 3s. 4d. a bushel at Port Adelaide. *Broomhall's Corn Trade News* describes the English wheat market on May 31st as "demoralised," and adds—"The fall in values since the beginning of last month has been severe, and it is a moral certainty that it will be followed by a reaction. The abnormally fine spring weather in most States of North America and throughout nearly the whole of Europe has been perhaps the prime factor which has brought about the *débâcle*, but it is now generally admitted that the price was improperly advanced at the end of March, and that we are now paying the penalty for the American manipulation of the early spring. The volume of wheat now in motion is inconveniently large, especially as there are no signs of any distinct subsidence of the Russian stream of old wheat. . . . There are some who talk as if the demand must diminish or cease altogether after each additional fall in price, and as if a prospective big crop would be unsaleable; but it is more reasonable to look forward to an abnormally big demand at the present range of prices, and, for our part, we should not be surprised if the world's requirements of imported wheat next season should exceed 75,000,000 quarters, thereby creating a new record."

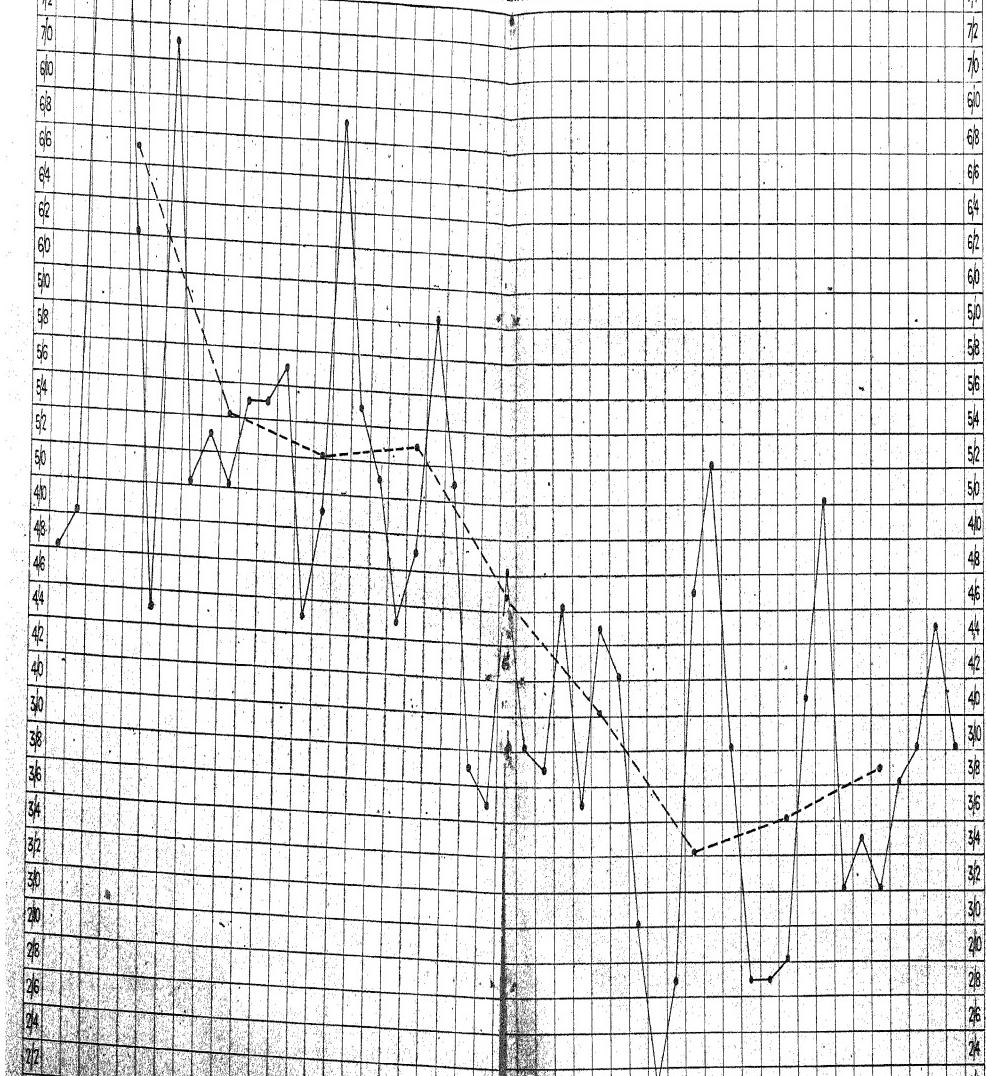
SD	1862	-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	-89	-90	-91	-92	-93	-94	-95	-96	-97	-98	-99	900	-01	-02	-03	-04	-05	-06	-07	-08	-09	SD
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AVERAGE PRICE OF WHEAT PER BUSHEL
AT PORT ADELAIDE
FROM 1862 TO JUNE 20TH 1910

Compiled by Government Statist

ANNUAL AVERAGE PRICE ——————

AVERAGE PRICE FOR PERIODS OF 5 YEARS - - - - -



Date.	LONDON (Previous Day).		ADELAIDE.		MELBOURNE.		SYDNEY.	
	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.	Per Bushel.
June 8	February 4/1	..	3/- to 3/2	..	3/4 to 3/4	..	3/3 to 3/4 b.	..
9	Dull; easier tendency	..	3/- to 3/3	..	3/4 ¹ ₂ ex store	..	3/3 b.; 3/5 to 3/6 s.	..
10	Quiet	..	Do.	..	3/4 ¹ ₂ to 3/5 ex store	..	3/3 to 3/4 b.; 3/6 s.	..
11	Dull; easier tendency	..	Do.	..	3/5 ..	..	..	..
13	—	..	Do.	..	3/6 ..	..	3/3 to 3/5 b.; 3/6 s.	..
14	Dull; easier tendency	..	Do.	..	3/6 ..	..	3/5 to 3/5 ¹ b.	..
15	Dull, but steadier	..	Do.	..	3/5 to 3/5 ₁ ..	..	3/4 to 3/5 ¹ b.	..
16	January 3/11 ¹ ₂	..	Do.	..	—	..	3/3 to 3/4 b.	..
17	3/11 ¹ ₂ off coast	..	Do.	..	3/4 ¹ to 3/5 ..	..	3/3 to 3/5 b.	..
18	Steadily held: not active	..	Do.	..	3/5 ..	..	3/3 to 3/5 b.	..
20	—	..	3/2 to 3/3 ₁	..	—	..	3/3 to 3/4 b.	..
21	4/0 ¹ ₂ afloat ..	..	Do.	..	3/5 ¹ ₂ to 3/6 ..	..	Do.	..
22	—	..	3/3 to 3/4 ..	..	3/5 ¹ ₂ to 3/6 ₁ ..	..	3/4 to 3/5 b.	..
23	4/1 ¹ ₂ afloat ..	..	3/3 to 3/4 ¹ ₂ ..	..	3/6 ex store ..	..	3/4 to 3/5 ¹ ₂ b.	..
24	Dull; April 4/2 ¹ ₂ (sailor)	..	Do.	..	3/5 ¹ ₂ to 3/6 ex store ..	..	3/4 to 3/5 b.; 3/6 s.	..
25	4/0 ¹ ₂ off coast ..	..	3/3 to 3/5 ..	..	—	..	..	..
27	—	..	Do.	..	—	..	..	..
28	April 4/1 ¹ ₂ (sailor) ..	..	3/3 ¹ to 3/4 ¹ ₂ ..	..	3/7 ..	..	3/5 ¹ ₂ to 3/6 b.	..
29	4/1 ¹ ₂ afloat ..	..	3/4 to 3/5 ..	..	3/7 ex store ..	..	3/7 s.	..
30	—	..	Do.	..	3/3 to 3/4 ..	..	3/5 ¹ ₂ b.; 3/7 s.	..
July 1	4/2 ¹ ₂ afloat ..	..	3/3 to 3/4 ..	..	3/6 b.; 3/6 ¹ ₂ s.	..	..	..
2	4/1 ¹ ₂ off coast ..	..	3/3 to 3/3 ₁ ..	..	3/6 to 3/6 ₁ ..	..	..	..
4	—	..	Do.	..	3/5 ¹ ₂ to 3/6 ..	..	3/4 ¹ ₂ to 3/5 ¹ b.; 3/6 to 3/6 ¹ ₂ s.	..
5	4/1 ¹ ₂ off coast ..	..	Do.	..	Do.	..	3/4 ¹ ₂ to 3/5 b.; 3/6 to 3/6 ¹ ₂ s.	..
6	4/1 ¹ ₂ off coast ..	..	Do.	..	Do.	..	3/5 b. (pare.)	..
7	Firm ..	..	Do.	..	3/6 ₁ ² ..	..	3/6 ₁ ² ..	..

STEAMER FREIGHTS.—Parcels, Port Adelaide to London or Liverpool, 22s. (d. per ton (7¹d. per bush.); full cargoes, Australia to United Kingdom—Continent, 22s. to 22s. 6d. per ton (7d. to 7¹d. per bush.); Port Adelaide to Sydney, 10s. 6d. per ton (3¹d. per bush.).
SAILOR FREIGHTS.—During the past month a fair amount of sailor chartering was done. Rates ranged from 22s. 6d. to 23s. 9d. (7¹d. to 7¹d. per bush.) from South Australia to United Kingdom-Continent. Some chartering for South Africa was done at 19s. per ton (6¹d. per bush.).

AGRICULTURAL BUREAU REPORTS.
INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		July.	Aug.			July.	Aug.
Amyton	1092	—	—	Meningie	1115	23	20
Angaston	†	16	20	Merghiny	*	7	4
Appila-Yarrowie	*	—	—	Millifcent	1119	12	9
Arden Vale & Wyacca	*	—	—	Miltalie	1103	16	20
Arthurton	*	—	—	Minlaton	*	23	27
Balaklava	†	9	13	Mitchell	1104	23	20
Beetaloo Valley	1095	—	—	Moonta	†	16	—
Belalie North	1095	16	20	Morchart	*	—	—
Bowhill	*	—	—	Morgan	†	16	20
Bowman's	1099	21	18	Morphett Vale	1115	19	16
Brinkworth	1096	19	20	Mount Bryan	1097	—	—
Bute	*	—	—	Mount Bryan East	1097	16	20
Butler	1102	—	—	Mount Gambier	1120	—	—
Caltowie	*	18	15	Mount Pleasant	1116	8	12
Carrieton	*	21	18	Mount Remarkable	†	21	18
Cherry Gardens	1111	19	16	Mundoora	*	—	—
Clare	†	22	19	Murray Bridge	*	—	—
Clarendon	1111-12	18	15	Nantawarra	*	20	17
Colton	*	23	20	Naracoorte	121-2	9	13
Coomooroo	1092	18	22	Narryd	*	23	—
Coomalpyn	1106	—	—	Northfield	1101	19	16
Cradock	*	23	20	Orroroo	†	—	—
Crystal Brook	1096	—	—	Parrakie	†	2	6
Cummins	†	16	20	Paskeville	†	16	20
Davenport	1093	—	—	Penola	1122	9	13
Dawson	1093	—	—	Penong	*	9	13
Dingabledinga	†	8	12	Petina	*	30	27
Dowlingville	*	—	—	Pine Forest	*	19	16
Forest Range	†	21	18	Port Broughton	†	22	19
Forster	*	—	—	Port Elliot	1117	16	20
Fowler Bay	*	16	20	Port Germein	*	23	—
Frances	*	15	19	Port Pirie	1098	2	3
Freeling	*	—	—	Quorn	†	23	—
Gawler River	1100	—	—	Redhill	1099	16	16
Georgetown	1096	23	20	Renmark	*	—	—
Geranium	*	30	27	Rhine Villa	*	—	—
Golden Grove	1112	21	18	Riverton	*	16	20
Goode	*	—	—	Saddleworth	1101	15	19
Green Patch	*	18	15	Salisbury	*	5	2
Gumeracha	1112	18	15	Shannon	1105	—	—
Hartley	1113	16	12	Sherlock	*	—	—
Hawker	*	25	22	Stockport	*	—	—
Hookina	1093-4	16	20	Strathalbyn	†	18	15
Johnsbury	†	16	13	Sutherlands	1108	16	20
Kadina	*	21	18	Tatiara	†	—	—
Kalangadoo	1118	9	13	Uraidla and Summert'n	1117	4	1
Kannmantoo	1113	15	19	Utera Plains	1105	16	20
Keith	1119	—	—	Virginia	*	—	—
Kingscote	*	9	2	Walkerie	1109	—	—
Kingston	*	30	27	Watervale	*	—	—
Koolunga	*	19	16	Wepowie	1094	—	—
Koppio	1102	21	18	Whyte-Yarcowie	*	23	20
Kybybolite	*	21	18	Wild Horse Plains	*	—	—
Lameroo	*	—	—	Willunga	†	2	6
Lipson	*	—	—	Wilkawatt	1109-10	16	20
Longwood	1114	23	17	Wilmington	†	21	18
Lucindale	*	—	27	Wirrabara	*	—	—
Lyndoch	†	21	18	Woodside	1118	—	—
Maitland	*	2	6	Yallunda	*	—	—
Mallala	1100	4	8	Yongala Vale	1099	16	20
Mannum	1107-8	30	27	Yorketown	*	9	13

REPORTS OF MEETINGS.

Edited by W. L. SUMMERS.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

Amyton, May 24.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Donoghue (chair), Gum, Quirke, Wallace, Crisp, Cormack, Griffin, Thomas (Hon. Sec.), and four visitors.

FALLOWING.—The Chairman read a paper on “Fallowing” to the following effect:—The best time to fallow in this district was July and August, continuing into September if necessary. The land should be stirred with a scarifier or skim plough early in June, and then, when fallowing in the months named, the soil should be ploughed to a depth of not less than 4in. If sufficient horse-power was available, 6in. was a better depth still. He had had better crops from land fallowed in August and September than from that which was fallowed in June, as the June fallow had to be scarified when dry to kill the weeds. Unless weeds had to be killed, the best implements to use on the fallow after the plough were the harrows, and these were not used enough. Fallow should be harrowed after every rain. The harrows should be well sharpened and fairly heavy, so as to penetrate the soil and leave a fine tilth. Members agreed that it was wise to give land intended for fallow a light working before ploughing, as this caused the seeds of weeds to germinate; it pulverised the soil which would soon be turned under to form the seed bed, and also made deeper ploughing possible with limited horse strength. Several members spoke of the value of early fallow. Land should be fallowed as soon as possible after the germination of the weeds, and there was need for some implement for their destruction other than the harrows. They thought the failure of the crop on the Chairman’s early fallow was entirely due to the fact that he had to work it to kill the weeds when it was very dry. Fallow land could not be worked when in a very dry state without injury to the succeeding crop. The earlier the land was fallowed the more moisture was stored in the soil from the winter rains, and evaporation could be greatly retarded if the harrows were frequently used.

Coomooroo, June 20.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Berryman (chair), Brice, Jas. and Jer. Brown, H. and L. Avery, and Kildee (Hon. Sec.).

DISC CULTIVATORS.—Mr. Jas. Brown reported that he had used a disc cultivator for some time, and had found that though it would pass through a fairly thick coat of straw, etc., would cut hard ground, and was not a heavy implement to draw, it was not a success. It left ridges, and missed a strip of soil altogether in the middle. It had to be lifted to pass over any obstacle, and there seemed to be too much wear on the axles. Mr. Brice had found a similar implement passed over all kinds of obstacles very satisfactorily. Mr. Jer. Brown thought the price of these implements was high, and that in this district the ground varied too much for them. The clay stuck to the discs and they did not cut the ground properly. It was agreed that without further trial locally they should not be dismissed as unsuitable.

ANNUAL REPORT.—The Hon. Secretary reported that 11 meetings had been called. The number on the roll was 19. Papers had been read on “Water Supply on the Farm,” “Blacksmithing,” “Care of Farm Implements,” “Care of Horses,” “Summer Fallow,” and many other subjects had been discussed.

Daventry, June 9.

(Annual average rainfall, 9in.)

PRESENT.—Messrs. Bothwell (chair), Hogan, Messenger, Roberts, Rogers, and one visitor.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Rogers—a fruit-growing property recently acquired by him. Although it was somewhat early in the season Mr. Rogers gave a demonstration of pruning apricot trees, indicating which were the fruit-bearing shoots. Some of the trees were affected by the peach borer, and several of these white grubs were dug out. Vine pruning was also witnessed. Mr. Rogers had begun to replace some of the older trees in the garden, as they were becoming unprofitable. Immediately round the dwelling-house the trees had been planted more uniformly and presented a much better appearance. Members were kindly entertained by the host and Mrs. Rogers, and refreshments were handed round.

SAND DRIFTS STOPPED.—It was noticed that the sand drifts about Stirling had been overcome, and the roads were consequently much better.

RABBITS BARKING TREES.—Members wished to know whether some mixture could be applied to the trunks of trees to prevent rabbits from destroying them. [Several different preparations may be used for this purpose, but they have to be renewed at intervals. A thick wash consisting of high-smelling blood, lime, and sulphur painted on the trunks usually remains effective for several months.—ED.]

SEASON'S PROSPECTS.—The district was said to have benefited by the late rains. The crops and grass were looking well and gave promise of a bountiful return.

Dawson, May 21.

(Average annual rainfall, 10½in.)

PRESENT.—Messrs. Renton (chair), Burden, Hughes, Baker, Quinn, E. W. and S. Smart, Ferguson, Meyers, Stigwood, and Nottle (Hon. Sec.).

PREPARATION OF LAND FOR FALLOW.—The Chairman, after many years' experience, had come to the conclusion that the best way to prepare stubble land for fallowing was to break down the stubble with the harrows and then leave it till time to plough it. He thought that if the stubble was left till fallowing time it would be a difficult matter to get the implement to do good work. He did not burn stubble, as that wasted useful soil and plant constituents. By breaking it down as described it could be ploughed under and kept the hard patches open to receive the rain. Mr. Smart burned the stubble if sowing the same land again; but if fallowing preferred to plough it in. Some members thought it best to feed off the stubble with sheep. They cleaned up everything and did more good than horses or cattle. Mr. Meyers used a rake on the stubble and burned it. He thought the loss to the soil was made up by the manure drilled in, and also that a considerable quantity of rubbish was destroyed by the fire.

Hookina, May 28.

PRESENT.—Messrs. W. Henschke (chair), A. and T. Henschke, Henschke, jun., Woods, Sheridan, S. and F. Stone, Carn, Murphy, Gloede, Madigan (Hon. Sec.), and one visitor.

CARE OF IMPLEMENTS.—Mr. Sheridan read a short paper on the care of farm machinery and implements. These, he said, covered a wide range and represented a lot of money; they should therefore be carefully dealt with and preserved. Ploughs, cultivators, and harrows, and similar implements without much wood in their construction suffered very little from the elements if painted every second year. Red lead and oil made a good preservative paint for woodwork. After the season's work was done, all implements should be carefully overhauled and broken parts mended or replaced. Loose cogs, nuts, etc., should be tightened up, and all made secure. They should then be put in a shed and protected from the elements. In his opinion, the stripper was the most ill-used machine on the average farm. In the discussion which followed Mr. Henschke thought implement sheds were best constructed with iron throughout, only leaving a 6ft. opening on one side. These he considered better than straw sheds, as they could be kept cleaner, were thoroughly watertight, and could be used to catch rainwater. They could also be turned into barns very easily if required for wheat at any time. Where paint was perished the wood should be well soaked with boiled oil before applying fresh paint. Members generally, however, were more inclined to favor the straw sheds. They were cheaper to build and kept at a more even temperature. They thought it unnecessary to cover

ploughs and harrows if they were kept well painted. Mr. Carn did not think it wise to stop to overhaul and repair before winter. The wet months afforded time and opportunity to do this sort of work for all implements and machines. Strippers should be carefully overhauled before starting.

Hookina, June 25.

PRESENT.—Messrs. W. Henschke (chair), F. and S. Stone, T. Woods, Sheridan, Kelly, J. and T. Henschke, P. and B. Murphy, O'Connor, Carn, Maidgan (Hon. Sec.), and four visitors.

RABBIT DESTRUCTION.—The following paper on this subject was read by Mr. S. Stone :—
“ One of the greatest difficulties the landholder of to-day has to contend with is the rabbit pest. The ravages caused by this vermin run into many thousands of pounds annually, and mean a big loss to the State. Despite this great loss no means has yet been devised capable of totally eradicating the pest. It is only since the introduction of vermin-proof fencing that bunny has been kept within reasonable bounds. Even under these circumstances it is a hard matter to thoroughly wipe him out. Netting fences are no doubt the most satisfactory means of keeping the rabbit in check, as they seldom burrow under the fence. A few may go over, as the rabbit is a good climber, and is often to be seen hung up in acacia trees 8ft. or 10ft. above the ground, where he has climbed to partake of the foliage; 3ft. 6in. netting will keep most rabbits out, and if it is sloped outwards a little under the ground it is much better than allowing it to hang perpendicularly, as the rabbits usually dig down close to the netting, and when they come upon the sloping parts are bluffed and leave. Trapping is the best means of catching them inside vermin-fenced paddocks, where they are still fairly thick. After thinning out in this way the burrows can be filled in, with good results following; but to fill in burrows when the rabbits are thick is only a waste of time, as you may do this a dozen times and still the holes will be opened. For the same work the fumigator can be used with good results. For large areas of outside country, where the rabbits are fairly scattered, nothing is so effective as the ordinary poison cart. S.A.P. rabbit poison gives good results when served in this way, as it contains ingredients which are very enticing to the rabbit. It is also very easy to prepare. In the winter season the rabbits go into the hills and breed where they are not disturbed, but in the summer, when feed and water are scarce in the hills, they swarm on to the plains by thousands and bring destruction to the grass and wheat crops. When the rabbits swarm in in this way it is an easy matter to trap them by wire netting dams. By catching in this way the skins can be turned to profitable account: but this is a very small return in comparison with the amount of damage caused by their presence.” Members agreed with the writer, but some thought it best to procure phosphorus and mix it themselves to the required strength. .

Wepowie, May 29.

(Average annual rainfall, 12in.)

PRESENT.—Messrs. Halliday (chair), T. and A. J. Gale, Crocker, Fuller, Knauerhase, J. and T. F. Orrock (Hon. Sec.).

ENGINES FOR FARM WORK.—The Hon. Secretary read a paper on this subject. Farmers were disposed to treat nearly all new machinery as unnecessary and not worth the outlay involved in securing it. This was, therefore, the attitude adopted towards engines by a good many. They seemed afraid that if they bought one a drought might follow and they would regret the expenditure. He considered that in a season of drought the benefit of an engine would be most felt. If a farmer had a well or spring and an engine to raise the water, he need have little fear for his stock. The upkeep of horses for work which could be done by an engine was a serious item. A few tons of hay purchased at the high prices which ruled a few years ago would soon run into more than the cost of an engine. In addition to chaff-cutting and irrigation an engine could be used for corn-crushing and wood-cutting. In the hay season a handy man could erect elevators to carry sheaves on to the stack at comparatively little cost, and these could be worked by the engine. He preferred the petrol to the oil engine. The petrol engine was quickly started and needed no heating up. It was much less troublesome than the oil engine and weighed very much less. Members agreed that an engine could be put to so many uses on a farm that it would soon repay its value.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

Beetaloo Valley, June 20.

PRESENT.—Messrs. F. Bartrum (chair), A. Bartrum, Thyer, Curtan, Jacobie, Woolford, Ryan, Burtan, Murphy (Hon. Sec.), and two visitors.

CARE OF FARM IMPLEMENTS.—The Hon. Secretary read the following paper:—
“In this district, where the roads are rough and most of the cultivated land is hilly, the cost of the upkeep of vehicles and machinery is always high, especially in regard to repairs and renewals. Thus it is important that we keep what implements we have in thorough repair, and make them last as long as possible. I do not believe in spending a lot of money repairing an implement that has gone out of date, as it sometimes pays better to discard an out-of-date implement, although in good order, if an improved one can be procured which will do better work. By sticking to an old implement a man is sometimes penny wise and pound foolish. We all know the effects of heavy rain and a hot sun on the woodwork of machines, wagons, &c. A little expense in erecting a rain-proof shed will be repaid many times over. I prefer sheds of stone and iron to those of straw. If they have plenty of ventilation the former are as good as the latter in the matter of temperature, and are fireproof, which means a saving of insurance premiums. A great preserver in the life of a vehicle or implement is paint. This is better applied in the summer, as the wood is then dry and absorbs paint better than in winter. Great care should be taken to see that all nuts are kept screwed up, as if this is not attended to the implement soon goes out of order. It will be found that nuts screwed up for several months will remain tight longer than those just recently done. Put in new fittings where required as soon as possible after the machine is finished, and have it ready for use. It frequently happens that where two pieces of iron are bolted together and work loose, the surfaces become smooth, and it is very hard to keep them bolted up tightly. A piece of leather or other packing placed between and bolted up will nearly always have the desired effect. It is a great mistake to work a machine or implement that is out of order or in need of screwing up, as this often leads to a serious break, and will, perhaps, cause a long delay at a critical time. A delay of a couple of days with a binder or harvester could easily mean a loss of several pounds through the crop over-ripening. It is impossible to be too careful about oiling a machine. The oil must reach the bearings, and the bearings should never be allowed to run hot.”

ANNUAL REPORT.—The Hon. Secretary reported that 10 meetings had been held in the year with an average attendance of over nine. Nine papers had been read and discussed. The interest throughout the Branch had increased generally, and a very successful year's work had resulted.

Belalie North, May 21.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Warren (chair), O'Leary, Davey, Cummings, Heithersay, Gum, Atkin, Bladon (Hon. Sec.), and three visitors.

HANDLING YOUNG HORSES.—Mr. Heithersay initiated a discussion on this subject. He thought a large percentage of farm horses were either poorly bred or spoilt by bad treatment. It was bad business to use the whip too freely on young horses, as it made them timid and easily excited. It always paid to study a horse and find out how best to treat him. Farm horses were usually so much handled from colts that they were seldom outlaws. Members agreed that the whip should not be used on young horses, except as a last resource.

Belalie North, June 18.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Murdock (chair), Atkin, Quin, Davey, Cummings, Arndt, Bladon (Hon. Sec.), and three visitors.

POULTRY FOR PROFIT.—Mr. Atkin read a paper on “Poultry-keeping.” Poultry could be kept to-day at a handsome profit. Oversea and inter-State markets had been opened up, and a great boon had come to the producer in the egg circles movement. At the outset it was best to procure a good laying strain of White Leghorns. These were the hens to keep if eggs were to be sold by weight. A dozen eggs in a store recently turned

the scales at 24ozs. A dozen from his White Leguorns weighed 26½ozs., and if picked from one hen would go 28ozs. to the dozen. This showed the opportunity for breeding from picked fowls. A few years previously he had a dozen mongrel hens which ate a bag of wheat without laying an egg. They soon shared a similar fate to the wheat. Now that White Leghorns had been purchased there was always a plentiful supply of eggs. The fowls were provided with clean, warm, houses. They were fed on warm bran and pollard mashes, with meat meal, oats, wheat, green stuff, scraps from table, &c., and properly cared for at all points. He proposed to purchase some good Orpingtons and cross with the Leghorns for the production of good table birds with the right colored legs and flesh for the English market. Unless an incubator was procured, a few common hens were required for sitting. He preferred the incubator, but did not advocate the use of a brooder.

Brinkworth, June 21.

(Average annual rainfall, 14½in.)

PRESENT.—Messrs. Davis (chair), Hawker, Stott, Brinkworth, Heinjus, Hill (Hon. Sec.), and one visitor.

PIG-BREEDING.—Discussion on the question of pig-breeding was initiated by Mr. Stott, who thought the industry was neglected in this district. It was a difficult matter to procure young pigs, and farmers would find breeding a profitable undertaking. He thought the Berkshire was the best pig for general purposes. Mr. Davis preferred the Berkshire-Essex cross. These were easily kept and grew well. The meat was sweet, and not coarse and stringy, as it was with some other breeds. The Berkshire-Tamworth cross he had found a prolific breeder and a good bacon pig, but the meat was coarser, and on account of their long, flat bodies the pigs required more feed than other breeds. Mr. Hawker was trying the pure Berkshire. Up to the present time he was quite satisfied. He also found that they were easily kept and grew well. Mr. Heinjus favored the Berkshire cross. He fed them on barley, either soaked or boiled. They did better on this than on wheat, and the bacon was sweeter and had more lean than that produced on the latter grain. Wheat tended to make greasy bacon and soft pork.

Crystal Brook, June 18.

(Average annual rainfall, 15in.)

PRESENT.—Messrs. Kelly (chair), R. and M. Pavay, H. and S. Billinghurst, Burton, Heaslip, Shaw, Carmichael, Flavel, Lovelock, Sutcliffe, Cooke, B. Weston, Morrish, Clark, Wood, Solomon, Vennen, and M. Weston (Hon. Sec.).

BUNT.—Mr. Burton initiated a discussion on "bunt" or "smut." He considered this trouble could be prevented by careful pickling, but also thought sowing under certain soil conditions affected the development of the disease. Some seed, he maintained, was more subject to smut than others. The use of the drill spread the spores by breaking up smut balls in the seed-box. Members were very divided in opinion as to the best method of pickling, strength to use, &c. Mr. Carmichael thought it unnecessary to pickle seed at all. Several members decided to conduct small experiments with pickled and non-pickled seed; also with wet and dry sowing.

Georgetown, June 25.

(Average annual rainfall, 18in.)

PRESENT.—A. Hill (chair), G. Hill, Thompson, Inglis, McAuley, A. Thomson, and Eyre (Hon. Sec.).

GOVERNMENT VETERINARY EXAMINATION OF STALLIONS.—The following paper on this subject was read by Mr. G. Hill:—"We shall soon be in the midst of another season, and again hear complaints regarding the examination of stallions. There is not the least doubt that this examination is a move in the right direction. During the year 1909 no less than 244 stallions were examined in this State. Dealing with the draught entire, which is of great importance in this district, we find by the December *Journal* that these were by far the most unsound of those examined. The number of draught horses examined was 103. The number of horses five years old and over that received certificates was only 21, and only some of these received life certificates. We must

naturally come to the conclusion that the horses are very unsound. No doubt the Government Veterinary Surgeon was correct when he said that the presence of so many unsound horses was due to condemned stallions being brought from Victoria by dealers. This will continue until some Act of Parliament prohibits the importation of horses three years old or over unless they hold a Government certificate of soundness. These condemned horses can be bought cheaply in Victoria, and the dealers easily find buyers for them here. What does it matter to the station-owner if it is a rejected sire? He may be a good type of horse, with all the good points that one would want for a station, and it does not pay to buy the high-priced horse to turn out with the risk of being kicked. In Victoria this system of examination has been in operation for three years, and as a result 15·83 per cent. of the stallions examined have been rejected on account of hereditary unsoundness; but the Government has no power to stop the use of the rejected sires. In 1907 918 horses, representing about 50 per cent. of stallions standing for public service in the State, were submitted, and of these 23·43 per cent. were rejected. In the following year 995 horses were submitted, and of these 25·41 per cent. were rejected. For the season 1909 the horses examined numbered 751, of which 29·69 per cent. were rejected. The number of horses examined in the three years was 2,664, and of these nearly 700 were refused certificates as being unsound, or rejected on account of being below a reasonable standard. There is not the least surprise that we have such a number of unsound stallions in this State when there is nothing to stop these horses from being brought here." The writer then proceeded to show that the present inspection would probably result in buyers of horses being very careful to avoid the progeny of unsound sires and breeders to refrain from breeding from them, as the day might come when their stock would be condemned for some unsoundness transmitted. He then quoted figures to show the effect of similar examinations of stallions held in other parts of the Empire, and that in some cases at least the standard of the stallions submitted had been materially raised. He favored the idea of parades, but thought the Government should pay carriage of animals and attendants to and from the places where they were conducted.

Mount Bryan, June 6.

(Average annual rainfall, 15½in.)

PRESENT.—Messrs. J. Hatherly (chair), H. R. Hatherly, Wardle, Kelly, Schmidt, H. E. Collins, A. Collins (Hon. Sec.), and one visitor.

SHEEP FOR DISTRICT.—Mr. H. E. Collins read a paper dealing with the most profitable class of Merino sheep for this district. For successful sheep-breeding the first essential was sound, robust constitutioned sheep to breed from. These could be easily selected by their bright, active appearance, large frames, and well sprung ribs. The next consideration was the wool. This country, being so high above sea level, was very cold and wet, and sheep with a strong wool of good quality should be sought. This class of animal was somewhat difficult to obtain at the outset, but careful breeding from selected stock would lead to its accomplishment. A payable sheep which would cut a heavy fleece of wool at a good average price per pound could be bred from a fairly strong ram and a medium ewe; or from a ram of rather more than medium strength and a strong ewe. The wool from such a sheep would not command top price, but would cut several pounds more to the fleece than the finer wools would in this cold district, and would, therefore, be the most profitable. It would be difficult here to keep up a strong flock of the finest wool sheep, as they were never so strong in constitution as the class of animal described. To grow a heavy fleece sheep must have plenty of feed, and it paid handsomely to provide this and every care. Too much attention could not be given. A good supply of dry feed on the land in the summer carried the stock well into the winter and also afforded shelter for the young growth in the cold weather. It was well known that sheep suffered very much from cold, and unless sufficient food were available to keep up the animal heat the fleece would suffer just in proportion as the sheep suffered. He was sure the sheep here on the cold flats needed more feed than on the eastern side of the range.

Mount Bryan East, June 18.

(Average annual rainfall, 15½in.)

PRESENT.—Messrs. J. Thomas (chair), W. and T. Quinn, Doyle, Gare, Teddy, F. Thomas Tralaggan, and R. Thomas (Hon. Sec.).

RULES FOR MEETINGS.—Some discussion took place concerning the value of conducting meetings along recognised lines and with certain rules to be observed. Finally it was decided that (1) "Every member shall rise to speak." This, it was thought, would cause speakers to think a few moments before speaking and would do away with the trouble of more than one person speaking at the same time. (2) "Every member shall express his opinion of each paper read." The object of this was to encourage a more free exchange of ideas. Other details were arranged having as the object the fitting and effective carrying out of the objects of the Bureau.

Port Pirie, June 4.

(Average annual rainfall, 12½ in.)

PRESENT.—Messrs. Johns (chair), Hawkins, Eagle, Welch, Greig, McEwin, and Wright (Hon. Sec.).

TREE-PLANTING.—Mr. Eagle read a paper on this subject. On large tracts of land in this State there was very little timber, and much that was to be found growing was scrub of little value. This scrub was being cut down and burned to clear the land for growing something profitable; consequently, though the demand for timber for fencing, building, railway construction, cabinet-making, &c., was increasing, the supply was decreasing. Climatic conditions, soil, &c., determined what might profitably be grown in any given locality. The soil of this district seemed more suited to the production of cereal crops and grazing than of timber, and consequently residents looked to Western Australia for jarrah, to Tasmania for hardwood, and the Baltic for deals, &c. The high values ruling for land made it necessary to grow the most profitable crops possible. Although the rainfall in this district was not sufficiently great to make timber-planting on a large scale profitable, everyone who had land might with advantage plant a few trees, even if only peppers, to serve as a breakwind. Planting timber trees was to a large extent working for the next generation, and this did not commend itself to people in an age when the main object was to turn money over as quickly as possible. The beauty of the trees, however, in addition to the shelter afforded and the satisfaction of enriching the State, should be sufficient reward and inducement to landholders to plant. Timber-planting should, under these circumstances, be undertaken by the Government, district councils, and other local bodies. There were thousands of acres along the railway lines which might be used in this way. The trees would prevent growth of grass and thus lessen the danger of fires being started by sparks, and would in the future years provide timber. On farms in rougher localities, where the land was cut up with watercourses, rough patches, and stony creeks, and where the surveying had been irregular, fields might be squared and awkward corners turned to use by tree-planting. The roots would help to bind the soil and lessen the wash, and so turn to good account land which was of little value for cereal-growing. In this district the sugar gum grew as well as any tree with which he was acquainted; but a reference to the Forest Department might result in intending planters learning of other profitable trees for the locality. In the discussion which followed Mr. Hawkins said this matter should have more attention than it received. He liked the idea of planting trees on the railway reserves. Mr. Greig also agreed that more attention should be given to tree-planting. Scientists had said that the devastation of forests had diminished the rainfall. The forests of Bundaleer and Wirrabara had both given a satisfactory return, which proved that suitable timber for mercantile use could be grown in the State. A certain amount of care should be exercised in planting trees near to netted fences on sandy land, as the leaves and rubbish would be liable to hold the sand, and so in time might possibly cause the fence to be covered up. Mr. McEwin considered that, where possible, every homestead should have some trees growing. Apart from giving the homestead a more attractive appearance, the shelter afforded to the stock in the summer and winter would more than repay for the planting. Mr. Welch referred to the danger of trees and limbs breaking off if planted alongside the railway lines. It might not be wise to plant the railway reserves with trees on that account. Every farmer should try to improve his property by planting trees of some kind.

PURCHASE OF SUPER. IN BULK.—The Hon. Secretary was requested to obtain quotations for a parcel of 100 tons of super. delivered at Port Pirie.

SEEDS FROM SPAIN.—Mr. Hector presented members with small parcels of seeds of peas, beans, and several varieties of wheat which he had procured when travelling in Europe recently.

Redhill, June 21.

(Average annual rainfall, 16½ in.)

PRESENT.—Messrs. Lithgow (chair), Pilkington, Vivian, Robertson, Treloar, Lines, Coffey, Stone, Smith, and Dunsford (Hon. Sec.).

CULTIVATION OF SOIL.—Mr. Lines read a paper on this subject to the following effect:—Fallowing should be commenced as soon as sowing was finished. The depth to plough was governed by the nature of the soil, but he thought 4 in. deep enough. “Be sure to turn all the ground, leaving none green and unbroken. As soon as fallowing is finished it should be cross-harrowed. This should be done after rain to conserve all the moisture possible. A farmer must always work according to the nature of his land and the weather. Cultivating the fallow should also be done across the furrows and not less than 3 in. deep. Crossing the furrows breaks the sod that is turned over by the plough. The fallow should be worked as often as possible after rain. If cultivated last, after rain, the harrows are sufficient, provided there are no weeds. In cultivating the clods came to the surface and harrowing breaks them up, making a fine seed bed. When rain comes at seeding time do not be in a hurry to start sowing, but first run the harrows over the land as soon after the rain as possible. I do not believe in deep ploughing in this district, but work the land well to the same depth with a fine cultivator. Harrowing after the drill is a good practice. Suppose you have started drilling in dry soil and there is no moisture to start the grain, and when some 50 acres are in it rains. About three days after, or at a time when the grain has started well, the harrows should be run over, crossing the drilling. Clean though your ground may appear, there will be a great number of small weeds after the rain, and the harrows will destroy these as well as levelling the land and making it better for harvesting. Further than this, it is the last chance of breaking the surface to retard evaporation. The wheat also can then come through the soil without the slightest check, and this means a great deal to the tender plant.”

Yongala Vale, June 18.

(Average annual rainfall, 13½ in.)

PRESENT.—Messrs. Battersby (chair), Chigwidden, Edson, T. and W. Keatley, Scott, Schmidt, and five visitors.

HORSES' TEETH.—Mr. Battersby initiated a discussion on the treatment of uneven and faulty teeth in old horses. Members were divided in opinion as to which gave more satisfactory results—filing and clipping, or extracting the faulty teeth. Some had had good results with the former method, while others had not. The treatment for lampas was condemned by all members, and it was pointed out that the trouble was caused by growing teeth, and that it disappeared when the teeth were cut.

MOLASSES.—Molasses, thinned with water and mixed with chaff, was considered an excellent food for horses during the cold weather, but was thought to cause trouble in attracting flies in the hot months.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

Bowman's, June 16.

(Average annual rainfall, 13 in.)

PRESENT.—Messrs. Smart (chair), Fraser, J. and J. S. Lomman, Williams, and Gale (Hon. Sec.).

WHEATS FOR DISTRICT.—Discussion took place concerning the varieties of wheat most suited to local conditions. Mr. Williams thought Federation the best for grain, and he was trying Bunyip and Huguenot this year for hay. Mr. J. Lomman also favored Federation, but he had also had good returns from Neuman's Early. The Chairman thought Gluyas and Neuman's Early were the best two wheats for the district.

RENAMING BRANCH.—At this meeting it was decided to call the Branch “Bowman's” instead of “North Inkerman,” as previously.

Gawler River, May 20.

(Average annual rainfall, 18in.)

PRESENT.—Messrs. Roediger (chair), Leak, Dawkins, J. and B. Hillier, Clements, Richter, Hayman, A. J. and S. C. Davis, F. and A. Bray, Dunn, Winckel (Hon. Sec.), and about 30 visitors.

DRY FARMING.—The Hon. T. Pascoe gave an address on this subject. Dry farming, he said, was a misnomer for a system of conserving moisture. In his lengthy experience in dry districts, promising crops had often failed through lack of moisture at the critical time. His attention had been directed to Mr. Campbell's Manual on Dry Farming, and he had studied it. Many of the theories advanced by this writer coincided with observations made by himself, and he resolved to test the matter. He had noticed, in the days of the seedsower, that the wheat germinated better in the wheel tracks than elsewhere, and the difference was to be seen right through the later stages of the crop. Some of the main principles of the Campbell system were to avoid working soil when very wet or very dry. The finer the soil round the roots of the plant the better. Fine particles retained much more moisture than coarse particles. The preservation of a mulch of loose soil on the surface tended to retard evaporation. The method of working was to break up the surface of the soil early in the year with a disc implement. This worked all rubbish into the top soil and allowed the moisture to reach the subsoil more easily. The plough turned the loose top soil under and the subpacker following the plough consolidated the under soil or seed bed. Land should be worked after every rain, either with harrows or cultivators, according to the amount of rain. Thorough cultivation, in addition to admitting and retaining a maximum amount of moisture, produced a more even soil temperature, and so facilitated the work of bacteria in preparing the various constituents required by the wheat plant. Cultivation did not cease with seeding, but harrowing after the wheat had stooled was part of the system. Mr. Pascoe was convinced that the system was well worthy of general consideration where there was any lack of moisture. So far, it had not been tried in this State in a year which could be called really dry. His own crops grown in this way had averaged 6bush. or 8bush. per acre above his neighbor's crops grown under the old system. Others had had even better returns than his by following the practices described. One advantage of cultivating before ploughing was that it extended the time of fallowing by a month or six weeks. Discing was not practicable on all classes of soil, but scarifier and harrows would answer as well. In answer to a question Mr. Pascoe said the subpacker was more adapted to loose friable soil than for stiff land, and it was not generally necessary in wet districts, as the rain to a certain extent consolidated the under soil; but even in such parts it might be an advantage in dry seasons, or for late fallowing. Some farmers skim-ploughed and then ploughed later to the required depth. This produced similar results to discing or cultivating, but involved more time.

Mallala, June 13.

(Average annual rainfall, 16½in.)

PRESENT.—Messrs. Marshman (chair), Jarmyn, Webb, Worden, Moody, Nevin (Hon. Sec.), and two visitors.

MOTOR TRACTION FOR FARMS.—Mr. F. East read a paper to the following effect:—Even in the past 10 years wonderful improvements had been effected in farm machinery. Ploughs were now used with from five to 12 furrows, and cultivators with 11 to 20 tines. Improvements were being made daily, and one wondered what changes the next decade would bring about. He firmly believed that within that period the farms of this country would be worked with traction engines of some description. Horses worth anything from £300 to £600 could only plough, in many parts, six acres a day. This amount invested in a tractor would buy a machine of about 50 horse-power, capable of hauling more than four times as much as the horses. He thought this fact would spur on inventors and those desirous of growing wheat at a minimum cost per acre, and that they would produce a machine which would deal with the various parts of farm work in a cheap and effective manner. In other parts of the world two winding engines with endless cables were employed to cultivate the soil, and although these were a long way from perfect, he was sure they would ultimately lead to the construction of some tractor which would be used throughout the Commonwealth. Members thought the progressive outlook of the paper was quite warranted. They were of opinion that some motive power would eventually be applied to farm work which was now done by horses.

Northfield, June 21.

(Average annual rainfall, 19in.)

PRESENT.—Messrs. Williams (chair), Dall, Goldney, E. W. and N. S. Kelly, Eastwood, and Mitchell (Hon. Sec.).

FRUIT-GROWING.—Mr. N. S. Kelly gave an address on fruit-growing. In regard to suitability of soils he said oranges fared badly in clayey soil, but flourished on river flats over water-washed stones from 4ft. to 7ft. below the surface. Apples needed a loose top soil and clayey subsoil, no matter how stiff. Creek flats were ideal spots, but stiff surface soil or rubbly limestone should be avoided. For apricots and peaches stiffness of top soil was no detriment if there was an under layer of limestone. Apples could stand a fair amount of moisture, and pears much more, while the peach could do with more than the apricot or the plum. Quinces were hardy and could stand a lot of water; but the almond required a well-drained bed, and frequently failed in places where the apple did well. Subsoiling was unnecessary in this district, but deep ploughing, careful harrowing, and the removal of all stones and roots were essential to success. The diagonal distances he recommended between trees were—for stone fruits, from 18ft. to 20ft.; citrus, 20ft. to 25ft.; apples, usually 18ft. to 20ft. for the best commercial varieties, but upwards of 30ft. for others; almonds, in single rows, 14ft. The holes for planting should be about 2ft. square, the middle of the bed being higher than the sides, giving the roots a downward slope. It was only necessary to break through any limestone encountered, the roots would do the rest. A depth of 1ft. was sufficient for most trees, citrus included. He would plant early in June and select trees not more than one or two trees old. It was best to reject all that were not well rooted; prune the roots, and plant at the same depth as in the nursery. To prune successfully was a matter of experience. A good rule was to keep the trees open. The apricot and late peach presented few difficulties, but the early peach, pruned as often as three times a year, sometimes baffled experts. Citrus trees did better if not touched till they were five years old. Even after that a little thinning was all that was necessary. The orange was delicate, and frequently a pruned limb died back to the parent stem. When cutting off dead wood, a little of the dead part should be left. The best time to spray was when the buds were developing. For fungus diseases he used Bordeaux mixture—1lb. of bluestone, 1lb. of lime, to 40galls. of water. It was no use to make the mixture stronger, but rather to spray again where necessary. For aphis, tobacco water and for codlin moth arsenate of lead were the best sprays. When picking apricots and peaches it was necessary to exercise care, or the tree would be damaged, and much fruit might be lost the following year. If the stems of oranges and lemons were cut and the fruit sweated for three or four days and then packed in bran, they would keep for 12 months. Stable manure was usually the best. If the trees did not fruit well, sulphate of potash would be found of benefit in the local soils.

Saddleworth, June 19.

(Average annual rainfall, 20in.)

PRESENT.—Messrs. Frost, Eckermann, Parker, Graham, and Coleman (Hon. Sec.).

WHEAT AT ADELAIDE SHOW.—It was considered that the Bureau exhibits of wheat made at the show in March last were not up to standard. Only three exhibits were staged and these were not satisfactory.

BREAKWINDS.—For quick growth sugar gum was recommended by some. Others favored the red gum on account of its more handsome appearance and spreading form. Pines planted locally alternately with sugar gums did not get on very well. The latter trees seemed to get too far ahead of the pines.

HAY CROPS.—Mr. Eckermann reported that last year he drilled a bushel of oats and 70lbs. super. per acre across a piece of land already drilled with a bushel of wheat and 70lbs. super. The result was a heavy crop of excellent hay.

Salisbury, June 17.

PRESENT.—Messrs. Moss (chair), J. Harvey, Richardson, E. V. and A. H. Harvey, Sexton, and Jenkins (Hon. Sec.).

AGRICULTURAL ADVANCEMENT.—Mr. J. Harvey read an interesting paper, in which he traced the development of the farming industry of this State. Commencing with the very early days, in which the single-furrow wooden plough was drawn by bullocks and

the crop, reaped with a sickle, was threshed with the flail or stamped out by bullocks, he showed very good reason for the high prices then realised for wheat. The influx of people, consequent upon the opening up of the Burra copper mines, was responsible for a demand for new machinery, and iron ploughs and harrows appeared on the scene with threshing and cleaning machines. Following this came the first reapers, propelled by bullocks harnessed to a long pole. Draught horses, inferior to those of to-day, were imported and cost up to £100 per head. The land in these days was very dirty with wild oats, draks, and other weeds on account of the continual cropping of the same paddocks, and many crops were quite unprofitable. The adoption of fallow improved this to a large extent. The invention of the stump-jump plough made it possible to cultivate large tracts of country previously considered worthless unless grubbed and a further impetus to wheat-growing was thus given. Other machinery pushed on the forward march until to-day the farmer had an almost unlimited choice in machinery, implements, manures, varieties of wheats, and farming was reduced to a science. It was no wonder that with these facilities and the advantages of the Agricultural Bureau as a means of diffusing knowledge, the farmers of to-day were, on the whole, in excellent circumstances. To do any good on the land a man must have up-to-date implements, experience, and brains as well as muscles.

WESTERN DISTRICT.

Butler, May 23.

(Average annual rainfall, 13in.)

PRESENT.—Messrs. Tremberth (chair), Butler, Phillis, Young, Parker, Easther, Morrison, Jericho (Hon. Sec.), and one visitor.

CEMENT CONCRETE POST TEST.—Mr. Parker informed members that he had made several posts of cement concrete and found them very satisfactory. A cask of cement would just about make 10 posts. They were 7ft. long and 8in. square. The proportions of material used were as follows:—16galls. of gravel, 8galls. of sand, 4galls. of cement. Four No. 8 wires were put in each post, and this made them very firm. They were strong and would last a lifetime. Where timber was scarce they would be the cheapest and best to make a substantial fence. A good discussion of the question took place.

Koppio, May 19.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Price (chair), G. B. and F. Gardiner, G. and M. Howard, Newell, Thompson, Roberts, Brennan, Richardson (Hon. Sec.), and one visitor.

PROVISION OF EARLY FODDER AND PROTECTION FROM VERMIN.—Mr. G. B. Gardiner read the following paper:—"The importance of providing feed for stock during the autumn and early months of winter is a subject which should receive much more attention than it does from the average farmer, as at this time of year there is usually very little old feed left, and what dry grass there is has very little food value. I have lately noticed numbers of sheep dead through starvation, and those that are alive are pitiable objects: and these sheep are on what is considered some of the best country in the district. Of course, these conditions are brought about largely by the unwise practice of over-stocking and the lateness of the season; but it seems to me that the trouble could be averted to a great extent by providing some kind of feed, such as silage, or growing some such summer crop as lucerne or other fodder suitable to the soil and situation. I believe a paddock of kale would be found most useful. It could be fed off in the summer and then reserved until the autumn. It will grow very rapidly with the first showers, and give a lot of feed. I find that it grows well here without any very special cultivation, but, of course, in common with anything else, it does better with good cultivation and, I think, pays for the extra work and manure. A trouble which robs the stock of more

than half the grass on many of the paddocks here is the rabbit pest, which I consider is being very much neglected, and very little effort is being made to lessen the evil. I sometimes think that landowners must have become disheartened, and look upon it as hopeless to try to destroy them; but in that case it would be better to give up the country altogether, as it is quite useless whilst overrun with vermin. They eat everything that is any good and leave only the coarse and useless herbage for the stock. To those who think that rabbits cannot be got rid of, or at least be kept within reasonable bounds, I would say that my experience is very different, and I think that with reasonable effort one can reduce their numbers to insignificance. I have on several occasions spent about two or three hours with the poison cart on a large paddock and the result has been that I have had to look very carefully to find a live rabbit in the paddocks for months after; but, of course, when they are left to breed and increase on lands all round they come again, but still we manage to keep them in check, and if there was concerted action I think the phosphorus would soon make them scarce and the time and expense involved in this work would be justified by the results." In the discussion which followed Mr. Gardiner said he had good results from kale. It was a good feed and the district seemed to suit it. Lucerne, however, he considered the king of green fodders. A small paddock of this would be invaluable at this time of the year. The Chairman suggested sowing lucerne with wheat in small quantities during the autumn. Mr. Newell asked whether it was possible to sow kale with the drill, and whether kale or lucerne was cheaper to sow. Members thought this could be done by stopping up some of the holes and mixing the seed with super. and sowing thinly. They were generally of opinion that kale gave the best results. [It is very risky to mix seeds of kale and rape with super. To facilitate seeding, mix about 1lb. kale with 1ewt. bonedust or bone manure, and block up sufficient holes in the manure box to make the drills 28in. to 36in. apart.—ED.]

FIELD TRIAL.—Mr. Newell thought it would be of benefit to the farmers of this district if a field trial could be arranged. After discussion Mr. Newell was appointed a delegate to visit Yallunda Flat Branch to discuss the matter with the members there.

MARES LOSING FOALS.—Mr. Gardiner asked why mares slipped their foals so readily at this time of the year. Three of his mares had lost theirs lately. They had not been in heavy work. Members were at a loss to account for it unless the mares in question were in the habit of doing it. One gentleman present had known of a mare in a yard to slip her foal and in three hours nine other mares in the same yard had done the same. Members considered that in such cases the mare should be isolated.

Miltalie, June 11.

(Average annual rainfall, 14½ in.)

PRESENT.—Messrs. F. Jacobs (chair), Fairbank, Searle, Alm, W. G. and E. P. Smith, J. S., B., and T. Jacobs, Atkinson, J. A. and M. J. Luffin, A. R. S. and D. Ramsey, J.P., G. W. and I. W. Story, Heir (Hon. Sec.), and 31 visitors.

HOMESTEAD MEETING.—Members met at the homestead of the Chairman, and a thorough tour of inspection was made. The trees in the fruit garden, though young, had evidently received considerable attention and care. Discussion on pruning took place, and it was generally thought that the branches should be encouraged to grow thickly on the south-east side to help the trees to withstand the rough weather. The vegetable garden was in first-class order, and in it a patch of 150 kale plants looked splendid. They did well in this district, the only trouble being cabbage blight, a remedy for which Mr. Jacobs would like to know. [Spraying the plants with kerosine emulsion, or a tobacco and soap solution, will be found effective, but, of course, this would not pay if the crop was large.—ED.] Almost every household vegetable was to be seen, and all was protected by a strong netted fence. The cultivation was accomplished by means of a one-horse plough, cultivator, and harrows. In the pigsty, which was situated on a hillside, some healthy pigs were found to be in good condition—comfortable and dry. The yard was constructed almost entirely with barbed wire and netting—one corner only being enclosed as a shelter and roofed with straw. The stable was of iron, provided with a strong feeder. The chaffcutter was driven by an 8-h.p. Lewis motor. A stack of Algerian oaten hay of good color and containing plenty of grain was in close proximity. The horses looked well and testified by their appearance to the care and attention received. A high shed, built to contain about 40 tons of hay, came in for favorable comment,

Members thought a shed of this kind would soon save enough hay to pay for its cost. The barn was built of stone and roofed with iron, and three underground tanks were situated so as to catch some surface water as well as that which ran off the roofs. This supply, with the addition of two dams, kept the stock well supplied throughout the year. A blacksmith's forge and appliances was also fitted up to keep implements, &c., in repair. Members found it difficult to speak highly enough of the farm equipment and appointments, and of the condition of live stock and plant. They were entertained to tea and supper, and between these two periods of refreshment the business of the Branch was transacted and a paper to the following effect was read by Mr. D. Ramsey :—

CARE OF IMPLEMENTS AND MACHINERY.—For two or three years he worked a harvester over stumpy ground and was continually being stopped by breakages. Drills and ploughs shared the same fate, until at last he set to work and picked up all the stumps. This season he had drilled in 600 acres without any breakage of machinery, and felt sure, as the result, that it would pay any farmer to get rid of the stumps as quickly as possible. He could not speak too strongly of the practice of leaving valuable implements exposed to the elements. Woodwork, in such cases, swelled when wet and the nuts were drawn into the timber and became quite loose when the warm weather set in again. Men who would neglect machines in this way usually omitted to overhaul them before use, and consequently breakdowns occurred at a time when delay meant loss of money. He would build an implement shed, with the opening facing the east, and with an iron roof. To neglect the construction of an implement shed was a penny-wise-pound-foolish policy. Farmers who allowed fowls to roost on valuable machinery for lack of a proper place could by no means be termed thrifty. A good discussion followed. Members agreed that stumps and stones should be removed from the ground before drilling.

Mitchell, June 18.

PRESENT.—Messrs. Green (chair), Ness, Ward, W. A. and H. Gregory, D. and J. Sampson, O. J. and P. Green, McCormick, J. and W. Head, Brice, Howell, Miller, Jenkins, Molloy, Dorward (Hon. Sec.), and three visitors.

CARE OF IMPLEMENTS.—Mr. J. Head introduced this subject. To make the most of an implement all nuts should be tight when in use, but loosened and oiled when put away in the shed after the season's work. Broken bolts and other parts should be replaced as speedily as possible and no wire makeshifts permitted. Implements and machines should be stored in sheds when not in use, and wood and iron parts should be given a coat of boiled linseed oil or painted at least once a year. Any spring steel parts benefited especially from oiling, as if allowed to rust this material lost its temper and was liable to snap. Machines should be thoroughly overhauled before use, and a few minutes spent in examination of parts at the beginning of the day would often save hours later on. He did not believe in lending his implements, and it was a great mistake to allow them to serve as fowl roosts. Most of those present agreed with the writer regarding the several points touched upon. It was mentioned, however, that on a new farm in these outlying districts farmers were obliged to leave implements out until they had time to attend to shed-building.

SHEEP FOR DISTRICT.—This subject was introduced by Mr. O. Green. The best sheep for a farmer in this district to keep, he thought, was the Merino if wool was desired, or Shropshire if wanted for mutton. The latter were bigger sheep than the Merino and would do better on a given amount of feed. If a farmer had sufficient land cleared it would pay to keep a few sheep. The very troublesome weed, drake, was soon eaten out by sheep. Lambing should take place in May. Lambs born then had a fair chance to grow and had wool worth clipping at shearing time. Members agreed that it was a good plan to have a few sheep on a farm, not only for the meat supply, which was quite a consideration just now, but because of their help in keeping fallow free from weeds. They also assisted in killing mallee shoots. The crossbreds were considered best for ordinary farm purposes as they were the largest framed and were quieter than the Merino when in small flocks.

ANNUAL REPORT.—The Hon. Secretary reported that since the establishment of this Branch in February last five meetings had been held, with an average attendance of nearly 12 members. Seventeen visitors had been welcomed to the meetings. The following subjects had been dealt with during the period under review :—“Hay-growing,” “Smut and Preventives,” “Care of Implements,” and “Sheep on the Farm.”

Shannon, June 19.

PRESENT.—Messrs. W. G. Procter (chair), H. Procter, Williams, Vowles, Fleming, Dollard, Dearman, Habner, M. and J. Cronin, W. and H. Glover, G. and V. Gordon, W. M. (jun. and sen.), L. B., and E. B. Smith, and J. J. Cronin (Hon. Sec.).

FARMING IN MALLEE DISTRICTS AND IN SETTLED COUNTRY.—Mr. Williams read a paper describing the methods of wheat-growing in the Lower North districts, such as Manoora. The farms, he said, were cut into three parts and used in rotation for grazing, fallow, and cropping. Stubble was never burnt, but was ploughed in with fallow. Fallow was first ploughed after seeding was over. It was then harrowed, and afterwards cultivated. The harrows were again run over, and a ribbed roller was employed by some to break the clods. It was thought by members that the treatment of the soils in this district would be much the same as described in the paper in the course of a few years, but at present it was not possible for farmers away back in new mallee country to go in for the three-year system of fallow, feed, and crop. Mr. Gordon pointed out that it was necessary to burn stubble to kill the shoots. He believed in cropping two or three years in succession.

QUESTION BOX.—In answer to several questions the following opinions were expressed:—Mr. Gordon thought the best quantity of seed to sow per acre here was a bushel on fallow and new land, and three-quarters of a bushel on stubble. The quantity of seed already in the soil and the quality of the soil also had to be considered. Mr. Habner considered it did not pay to sow three crops in succession. Mr. Cronin thought it would pay if wisely cropped, e.g., one crop of early wheat, one crop of late wheat, and then a crop of oats for hay. Mr. Smith and others considered that wood ash was of considerable value to the crop. This could be seen wherever timber had been burnt and wheat grown. Mr. H. Procter said the value of feeding off growing crops depended upon the season. Last year it did good, but in such a late season as this it might cause failure.

Utera Plains, June 18.

(Average annual rainfall, 14in.)

PRESENT.—Messrs. Holmes (chair), A. and C. Vennig, J. and M. Abrook, J. and N. Guides, H., R., and T. Hornhardt, G. and A. Barber, Haines, Chase, Hill, Naughton, Gee, West, Ramsey (Hon. Sec), and 13 visitors.

WATER FROM GOVERNMENT CONSERVATION SCHEME VERSUS CEMENT TANKS AND DAMS.—Mr. Naughton read the following paper concerning water supply:—“In the first place, let us consider that my holding contains 3,000 acres in a district where the rainfall is only moderate, and has a frontage of two miles to a proposed water main. The first consideration is the expense. To sink dams and build tanks for a farm of the above acreage it will be necessary to divide it into at least 10 paddocks, and to find a suitable site for house and stables. The latter are built at one end of the farm, about half a mile from the proposed water main. It will be then necessary to find suitable places for constructing dams and tanks and to consider their holding capacity. I find that on my land all the best catchments are alongside the water main, and that they are not very extensive. After sinking six dams, each costing about £10, and building four tanks, each costing £20, I have a holding capacity of about 500,000 gallons, at a cost of £140, exclusive of my own time and labor. These dams, &c., are in five of the 10 paddocks, the largest dam being a short distance from my home. As I have not water in every paddock I am obliged to allow my stock to be continually crossing and recrossing my ground. In order that there may be a plentiful supply of water at the house and stables I am obliged to buy tanks and to have a wagon and horses and a rouseabout to cart it. It will also be the work of this rouseabout to keep all the stock on the farm watered. This man's weekly wage will be £1 and keep. In the meantime my stock are grazing in remote parts of the farm some miles from the nearest watering-place. It will take the best part of a day to round them up and drive them to water and take them back to their pasture land. This will have to be repeated two or three times a week, and thus much time in which the stock could have been feeding will be lost. My stock will therefore not be in as good a condition as they would be if otherwise watered. The result can easily be seen. I am either obliged to keep a rouseabout for carting water and driving the stock to water or else do it myself, which is quite out of the question. Then again, as the tanks near the house become dry or leak I shall have to go further, perhaps cross a paddock that has been fallowed or has a crop in it. Last but not least, where does my water come from? Does it come off my own ground, off my neighbor's ground, or does it come off Government roads, &c.? If the last is the case the farmer

is depending on the Government or the district council for his water, while the 'drains' and 'breaks' that he makes across the road are a source of danger to the travelling public. Now let us consider water supplied in pipes laid down from a Government reservoir. As my holding has a frontage of two miles it will cost me £21 per annum water rates, and to this must be added the cost of pipes and troughs for stock and stable use. These, when pipes are laid all over my farm, will cost about £200. I expect to have all this completed in 10 years. The advantages to be obtained from having the water carried to the farm in pipes are as follows:—Water may be laid on to every paddock, and I shall, therefore, not be obliged to drive my stock from one part of the farm to another; consequently my land will not be tramped down or be a mass of cattle or sheep pads. It will not be necessary to buy any tanks for water-carting, and I shall need four horses less on the farm, saving £80. I shall be able to have water at hand for chaffcutting purposes, and also in the stable yard. There will be plenty of water for domestic use, for pigs, poultry, and dairying purposes, and also for gardening. The revenue from the above would easily amount to £100 per annum. My stock will always be in an excellent condition, even if feed should be scarce. A plentiful supply of water that can be used at all times will tide them over the worst of droughts. Then again, I shall not need anyone to supervise the water supply, saving £52 per year in wages. I shall be able to leave the farm at a moment's notice and rest assured that the stock will have plenty of water, as all troughs will be fitted with ball taps. I may easily do some irrigation work, such as the growing of lucerne, barley, &c., for fodder for young stock. This could not be done under the other system of water supply. The water will be brought in pipes, at the expense of the Government, to my frontage. The source of supply is in the hills to the west of my farm, in an extensive dam; the water being from springs of an excellent quality, suitable for stock, domestic, or garden use. I have not to depend on the rainfall, the catchment area of my farm, the generosity of my neighbor, the district council, or the Government roads. Neither am I causing any inconvenience or danger to the travelling public. At the end of 10 years, under the first system it would have cost—Construction of dams and tanks, £140; cleaning out and repairing, £40; wages to rouseabout, £520; keep, £100; four horses, £80; total, £880, and the water limit would be 500,000galls. per annum. Under the second system at the end of 10 years my water rates amount to £210. It has cost me £200 for three miles of piping; troughs, &c., £150; sundry expenses, hose, &c., £150, or a total expense of £710, showing a difference of £170 in the outlay. To this must be added the £100 per annum extra revenue made possible by the installation of the second system, making a total of £1,170 in favor of the water laid on from the Government main. Alongside this magnificent balance we must consider the amount of time lost in the first and saved under second system; also the many minor advantages to be gained through having an unending supply at your doorstep, or even in the kitchen, and a water limit of 1,280,000galls. A little thought will show that these figures are not very wide of the mark when the time specified is considered, but of course they cannot be taken as actual, because circumstances may change results." The paper also suggested plans for laying out garden, orchard, and general farm buildings and yards. In the discussion which followed members thought the ideas expressed in the paper were good, provided they could be carried into effect. They considered that irrigation would require too much water to pay, and thought if the stock were watered for 12 months there would not be much of the allowance left.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

Coonalpyn, May 20.

(Average annual rainfall, 17*1/2* in.)

PRESENT.—Messrs. Hill (chair), Wall, Fidge, Bone, Liersch, Venning, Cavenagh (Hon. Sec.), and one visitor.

HOW TO MAKE LAND PRODUCTIVE.—Two papers dealing with the question of how best to prepare the local soils for wheat production were read by Messrs. Wall and Fidge. Mr. Wall said the first thing was to roll down the scrub and keep it down. It was not

profitable to let a paddock go after the first crop and roll down a fresh block of mallee. Extension work should not be done at the expense of cleared land. Judicious rotation of crops helped to bring the soil to a good state of fertility. About 1cwt. super. per acre was a fair application for this district. Fences should be made sheep-proof and a few sheep put on the farm. In addition to their value in improving the soil, &c., they were in themselves profitable. If he were afraid the wild dogs would kill sheep and lambs he would go in for horses and cattle. Poultry, if fed on good wheat, helped to swell the banking account, and pigs also. The latter should be kept to consume the offal. Farming in this way would, in his opinion, result in the best returns being won from the soil. Mr. Fidge's paper advocated rolling scrub in the summer and leaving it till the following summer before burning, so that the shoots would be well grown. After burning he would crop the land twice with wheat, burning the stubble each year. If the stubble were not thick enough for the fire to run, he would use the harrows to get it all burnt. He thought ploughing in stubble had a good deal to do with takeall. From 70lbs. to 100lbs. of super. per acre he thought best to apply. In February or March of each year shoots should be cut. After two wheat crops it would be well to sow two of oats, treating the soil in the same way as for wheat. The land should be ploughed each year, cross ploughed when possible. After the two crops of oats he would graze sheep on this paddock for two years, and then fallow as early as possible. Cultivate the fallow in the spring, when damp. By this time he thought the land would be in first-class order and would grow a good crop of wheat. Mr. Venning said that the best way to get the land in tip-top condition, provided a man had means to do it, was to roll and burn the mallee, plough after heavy rain, harrow or cultivate after heavy rain, and repeat the same treatment for three years before cropping. After this ordinary treatment to take place, but the land had to be sweetened before heavy crops of wheat could be grown. If this could not be followed, the best order was two crops of wheat, one crop of oats, then a self-sown crop, and then fallow. Mr. Fidge would only sow one crop of oats after wheat, and then would let the land lie for grazing for a year. Then he would fallow it. The Chairman said that once rolled down everything should be done to keep the mallee under. He also thought one crop of oats sufficient. The Hon. Secretary would crop twice with wheat, once with oats, then graze for a year, and afterwards fallow. He would roll scrub 18 months before burning so that the shoots would receive a greater check. Most of the speakers considered the method outlined by Mr. Venning to be too expensive to be practicable here. By following the usual procedure, they thought, as much return would be gained from the three crops as from the one big crop after the treatment described. In addition to this a consideration was the feed for stock which would be lost if no crop was grown for three years. They all agreed that sheep should be kept as soon as possible.

TAKEALL.—Members thought many practices helped to bring about takeall, such as ploughing in stubble and rubbish, ploughing light soil when dry, and cropping with wheat too many times in succession.

Mannum, June 4.

(Average annual rainfall, 11 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Preiss (chair), Schulze, Scott, Hein, Arnold, Wilhelm, Berriman, Pfeiffer, Greenshields, and Scheutze (Hon. Sec.).

FALLOWING.—Mr. Greenshields read a paper on fallowing. He considered that in this district, allowing for wear and tear of implements, it cost £1 per acre to grow and harvest wheat. It was, therefore, necessary to get the best possible yields, and to do this he was convinced that it was necessary to fallow. He would fallow early in June and July, so as to get as much rain as possible into the soil. The fallow should be harrowed down fine and harrowed after every nice rain. This to keep the surface loose and to settle the seed bed. If fallowing were done early, a good crop of weeds, &c., would spring up and this would help to keep the soil from drifting. This growth should be fed down with sheep and not allowed to go to seed. [If the land is harrowed after each rain there will not be much of a crop of weeds.—Ed.] A few sheep were almost a necessity in conjunction with wheat-growing. They helped to firm the soil, spread manure evenly, and kept the land clean. He estimated the value of sheep at 3s. to 5s. per head for this purpose only, and if ewes were mated to Shropshire rams they would produce lambs worth 8s. to 12s. per head, in addition to clipping 4s. or 5s. worth of wool. It was necessary to avoid over-stocking, and unwise to stock with sheep at all until fences were sheep-proof. Land in this district should be cropped only once in three years. Fallow the first year, then crop, and the third let it have an entire rest. By working in this way

he had no doubt that the average yield of 6bush. or 7bush. per acre could be raised to 15bush. or 20bush. Members agreed that on certain classes of soil fallowing was very beneficial, but were of opinion that there was a good deal of land in this neighborhood which was not suitable for fallowing.

Mannum, June 25.

(Average annual rainfall, 11½in.)

PRESENT.—Messrs. Faehrmann (chair), Haby, Pfeiffer, Schulze, Greenshields, Wilhelm, Hein, Mann, Heidrich, Arnold, Scott, Lenger, Berriman, Schuetze (Hon. Sec.), and one visitor.

TIMBER-PLANTING.—Mr. Wilhelm read a paper on "Tree-planting" to the following effect:—"Several years ago I realised that the timber on my land was a valuable asset, and decided not to destroy it as I had done before, but to reserve some part of it for the future. If destruction of timber is carried on at the same pace as it has been during the last 50 years, in another 50 years farmers will have to import coal or firewood into their respective districts, or bake their bread in the sun. Our own district was densely timbered less than 40 years ago; at the present day there are many farms here that have no fencing timber, and not enough firewood to last for the next 20 years. Every landholder should reserve a portion, and those who have destroyed all should plant trees and protect them. It will take a long time before they get timber and firewood out of young trees now planted. If mallee is cut down and the stumps left in the ground, in say 25 years there will be as much wood per acre as there was at first. Thus a supply could be kept up in a dry district. In wetter districts trees to suit the locality should be planted by every landholder; district councils should plant and protect trees on roads and reserves; trees should be planted along railway lines where soil and locality is suitable. The Government, in my opinion, would do well to reserve Crown land where there is large timber such as stringybark and gums. In our own district young pines and gums should be protected and encouraged to grow. We cannot look to other districts for a supply of wood, as the same destruction is going on everywhere without considering the wants of future generations. Buildings, fences, and railway sleepers may, in the near future, be made of reinforced cement, but people will not be able to do entirely without timber; therefore every landholder should do his share in planting and protecting timber." Members were of opinion that gum trees in bamboos were too young to transplant, and suggested that the Government would do better in the case of sugar gums to distribute seed and let people themselves raise the young trees for transplanting, and set them out when old enough.

Sutherlands, June 18.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Snell (chair), J. H. and G. Geyer, Thiele, Doecke, Byrnes, Mibus, Noack, E. Twartz, Dohnt, A. M. Twartz (Hon. Sec.), and five visitors.

EARTHWORMS.—An interesting paper on the value of the work done in the soil by earthworms was supplied by Mr. Broadbent and, in his absence, was read by the chairman. Worms, it was stated, were to be found in much larger numbers in good soil than in poor, and where there was a certain amount of moisture in the soil they thrived. In certain soils worms burrowed 4ft. to 6ft. deep, and thus admitted both air and moisture. The paper continued—"These burrows are wonderful works, especially when it is remembered that a worm has neither bones, jaws, nor teeth; in fact, no hard parts in its body. The worm produces great quantities of moisture or slime. With this slime it moistens the earth, and when so softened it is easily eaten. It passes through a gizzard, which, like the gizzard of a fowl, is muscular and strong. The earth, leaves, roots, and fibre are ground up, and finally discharged on the surface in little heaps or castings. These castings consist of rich vegetable mould, finely mixed. The earthworm is, therefore, a great soil maker and improver. It is constantly enriching and ploughing the surface soil. It not only carries the earth from below to the surface, but it frequently takes leaves, grass, and other vegetation into its hole." It had been estimated by Darwin, who studied worms for 40 years, that in moist English garden soil there were 50,000 worms to the acre, and in the fields about half that number. Fortunately, the very cultivation which was needed to produce good crops in this district put the soil in the best

condition for these soil-pulverisers to thrive in. Members were of opinion that where worms did no injury to crops, their presence was of value on account of the general improvement made in the condition of the soil.

MARKETING WHEAT.—An extract from page 895 of the May *Journal* was read by the Hon. Secretary. Members were surprised that scales should weigh 8lbs. short on a 4bush. bag. Finally, the following resolution was passed—"That in the opinion of this Branch (1) the quality of wheat sacks should be fixed by law in the same way as the size; (2) that wheatbuyers should be compelled to supply teamsters with an extract copy of the weight of each bag of wheat delivered."

DIARRHOEA IN FOWLS.—Mr. Dohnt wished to know how to treat fowls for this complaint. [The Poultry Expert replies—"The causes of diarrhoea in fowls are numerous, and without further details it is impossible to give full advice. Ordinary cases may be cured by giving from four to six drops of chlorodyne in a dessertspoonful of water daily. Most probably the drinking water is at fault, or, perhaps, the birds are sleeping on damp ground."—Ed.]

Waikerie, June 20.

(Average annual rainfall, 9in.)

PRESENT.—Messrs. Rowe (chair), Rogers, Jones, Baum, Lewis, sen., Borroughs, Morgan, Modestach, Burton, Emmett, Woods, Green (Hon. Sec.), and four visitors.

WHEAT v. FRUIT.—A good discussion took place on this subject. Mr. Borroughs considered that with wheat at 3s. a bushel a farmer was better off than a fruitgrower who had to wait so long before he got a return. Mr. Green thought that fruit-growing on the Murray on systematic lines a much more profitable pursuit than growing wheat in this district, as the average for the past 10 years had not been more than 7bush. per acre. The outlay on implements and stock for an orchard was not nearly so heavy as for a farm. Vines came into bearing in three years, and fruit trees in five years. Apricot trees, properly watered and pruned and cultivated, should return at least 1 ton of dried fruit per acre at £70 per ton; peaches, $1\frac{1}{2}$ tons at £60; currants at £40 per ton and raisins at £20 per ton should yield $1\frac{1}{2}$ to 2 tons per acre. This averaged £45 per acre, whereas an acre of wheat at 3s. would but realise 24s. for 8bush. A family with 10 acres of good land under irrigation and 150 acres of commonage land could make a really good living. Mr. Borroughs said he had spent a few years as a fruitgrower, and until this year had not made it pay. Mr. Woods had had similar experience, but acknowledged that he had bought a neglected block. Finally, a resolution was carried unanimously that to make an irrigation block a success and to provide for all contingencies a 10-acre block should have at least 200 acres of commonage.

Wilka watt, May 2.

PRESENT.—Messrs. W. Bowman (chair), A. and J. Ivett, Harvey, D. Bowman, Tylor, Altus, Lorrell, Neville, Short, and four visitors.

POULTRY.—Mr. Tylor read the following paper on "Poultry-keeping":—"The poultry industry is of considerably more importance to farmers and the public generally than is recognised by many. In *Farmyard*, eggs are usually looked upon as a by-product of not much value. If we were to keep a record of eggs, and work out the cost per egg produced, we should be surprised. It is said that farm hens would hardly average 80 eggs per year each, yet, in the competitions hens are laying upwards of 250 eggs each. This, of course, under ideal conditions. A few years back poultry-rearing was little thought about, except in conjunction with farms, but to-day there is a large number of poultry raisers in this State, showing that there must be a fair amount of profit in the undertaking. It is best to start poultry-raising on a small scale. First choose, say, 12 hens and one or two male birds. I prefer White Leghorns and Silver Wyandottes for laying and Buff Orpington for table purposes. I favor Buff Orpington and Indian Game male birds. The house should be built so as to let in plenty of fresh air, and so that it can easily be cleaned regularly. The perches should be about 18in. from the ground. Steel perches are preferable to those of wood, as they do not harbor tick and lice. [Hardwood perches swung on wires or fixed on tick-proof posts would be better. Steel is not suitable for perches.—Ed.] Poultry should be fed regularly. Where there is no food obtainable in yards and paddocks they should have cracked or crushed grain, which is easily digested. Bran and pollard should be given during moulting season, and plenty of greenfeed should be available all the year round. A supply of shell grit should be placed handy, so that the fowls can

take it when they like. Drinking water given fresh every day should be kept in a cool place. More disease is spread through impure water than from almost all other causes. The fowls whose eggs are required for breeding purposes should be shut up in small yards or runs with about six hens to one male bird. Only the largest and best shaped eggs should be selected for breeding purposes, as this goes a long way towards the production of healthy chicks. I believe in setting hens early, say, in June. Breeding nests should be placed on the ground, so that moisture can work into the eggs. They should be in a quiet corner where the hen will not be disturbed. I suggest that all Branches of the Bureau should join the egg circle, if one is near enough, as by this means the producer can get full market value for his produce." Discussion followed as to the best method of fixing perches and early hatching. Some members considered it unadvisable to hatch very early. The general opinion was that August till October was the best time.

WHEAT-GROWING.—The following short paper was read by Mr. Brooker:—"One of the most important parts of wheat-growing is to have the land properly worked before seeding is started. If a farmer can work his land the winter before as fallow, I think it will pay him to do so. If the land is just ploughed up after harvest it should be harrowed or worked down fine with a similar implement, as in this district, with the exception of new land, it turns up very rough, with clods in some places and very fine in others. Seed sown on land like that must produce a very uneven crop. Some seasons the late sown crops do as well as the early sown; but, I think it best to sow as early as possible and not wait to sow late with the chance that it may be a late season. A bushel of seed to the acre is a fair amount to sow, or even a bushel and a quarter, providing there is a fair amount of manure with it: the more manure applied, up to 1cwt. per acre, the better will be the crop. I think it wise to harrow all land after the drill, as where there are stumps there is bound to be some wheat not covered." The subject was freely discussed. Members thought 50lbs. of wheat and 75lbs. of super. the best quantities for early sowing, and would put it in May. Most of those present thought 60lbs. of wheat and 84lbs. super. per acre about the right thing for sowing after the first week in June.

Wilkawatt, June 18.

PRESENT.—Messrs. W. J. Bowman (chair), Twinny, Bowman, Gregerky, Brooker, A., J., and J. E. Altus, A. and J. Ivett, Sorrell, Tylor, Arhus, Harvey (Hon. Sec.), and eight visitors.

FEEDING AND CARE OF HORSES.—The Chairman read a paper on this subject. Although there might be some grounds for the statement that farm stock had improved in quality during the past few years, he felt sure the treatment of horses on the farms of this State was to-day no better than it used to be, and in many cases they were grossly neglected. This was proved by the number of hard-coated, sore-shouldered animals to be seen daily. A horse that was not well cared for could not render the same service as one better treated. If a man were worked as many hours as a horse without water and then given any quantity of it, he would probably imbibe sufficiently freely to upset him. Yet many owners seemed quite oblivious to this fact, and did not water their horses in a rational manner. He believed in giving the animals a drink before feeding, as water was needed in the stomach to aid the digestion. The average horse, after eating 10lbs. chaff and 4qts. oats, was full. If more than sufficient food was given it would probably be eaten as a general habit, but only served to crowd out some of that which was already there and pass it through the various channels in an undigested state. This was not only wasteful, but harmful. To old horses he would feed oats either ground, steamed, or boiled. Apart from this the diet should always be varied as much as circumstances would permit. A quantity of fresh, green grass was of more value for cooling the blood than a bucketful of drugs. Members were of opinion that for old horses oats should be crushed, as otherwise they were apt to bolt them. Young horses might have oats whole. In reply to a question it was stated that if horses were worked after sundown the coats became wet with dew, and would still be wet in the morning. Mr. Ivett had found it advisable to rub down his horses with bran bag till the surface of the coat was dry when they had been working late. They were then quite dry before morning.

FARM BUILDINGS.—Mr. Brooker read the following paper:—"The most important building on a farm is the stable. A good deal of the horses' time is spent there, and so it is important that it should be well made and built in a good healthy position. A good site is on the eastern slope of a rise, with the opening facing the downward run of the hill. In this way the water will run away from the stable instead of draining through the stalls. A straw roof has advantages, but I think an iron roof is, on the whole, preferable,

The stalls should be roomy, say not less than 10ft. by 12ft. for a double stall. Passage ways should be 4ft. wide or more, so that a bundle of hay can be carried along easily. They should also have a good door at each end. The chaff-house, if not a part of the same building, as the stable, should be as near as possible. The implement shed should also face the east, or, failing that, the north. It should be deep enough to take the large implements, say about 15ft., and 15ft. between the openings to admit of the implements being taken in and out easily. The wagon, which is generally left out altogether, I think needs a shed to itself. A good wagon shed would be one with a gable roof, open at each end so that the wagon can be pulled in instead of being backed in. The bore should be put down in the highest piece of ground that is near by. Then, with a tank stand about 10ft. high, the water can be laid on to almost any part of the farm." A good discussion ensued, members being in favor of the stable facing the east rather than the north.

SOUTH AND HILLS DISTRICT.

Cherry Gardens, May 24.

(Average annual rainfall, 33in.)

PRESENT.—Messrs. Stone (chair), Hicks, Ricks, Kayser, C. and J. Lewis, T. and A. Jacobs, and one visitor.

MANURING FRUIT TREES.—Mr. Kayser read a paper on this subject from page 331 of the November, 1909, *Journal*. In discussing the question, Mr. T. Jacobs thought this was a matter of sufficient importance to warrant experimental work on the part of members with manures. Mr. Ricks thought it would be cheaper to plough in as green manure peas, tares, or similar plants. Mr. Lewis considered that green manuring was as expensive as the use of commercial fertilisers.

SEASON'S PECULIARITIES.—Mr. A. Jacobs tabled some Quarrenden apples which had matured from February blooms. It was mentioned that everything in the gardens was late, especially the apple crop.

Clarendon, May 23.

(Average annual rainfall, 33 $\frac{1}{2}$ in.)

PRESENT.—Messrs. White (chair), H. C., A., and A. A. Harper, Peggot, Brooks, and Phelps (Hon. Sec.).

FARM HORSES.—Mr. Harper read a short paper dealing with farm horses. It was essential, he said, if good work was to be got out of horses, to feed and groom them well. To avoid giving a horse too much feed at a time he would advise giving a kerosine tin full at a time, and then a little more when that was cleaned up. The last thing at night the horses should be given just as much as it was considered they would eat. The farm could be kept stocked with horses by breeding one or two foals every year. A mare in foal could be worked, if carefully handled, for 10 months. The best farm horse for this district was a medium draught. This class of animal was better for local requirements than a very heavy, hairy-legged breed. It was a mistake to work horses before they were properly set. Three years was, in his opinion, quite young enough, and four years better still. When treating a colt, he should be handled quietly, and when put into the team should be allowed to go up into the collar naturally. It was unwise to force him for the first few times. Many a good colt had been spoilt by neglect of this advice. The question was well discussed. The Chairman thought many people drove their teams too far without a feed. He considered a horse should be fed after taking a load 10 miles.

MANURES.—Discussing the question as to best manures for the district, members favored bonedust and super. for the hay crop, and Thomas' phosphate as a change for the pea crop. Several of those present had applied ashes to the soil with good results. Mr. Brooks had put on 15lbs. to 20lbs. per acre of potash manure mixed with other fertilisers, and was sure the extra cost was paid for in the crop.

TREE-PULLING.—Members and others met at Messrs. Sandow's farm to witness an exhibition of the work done by the Bunyip Tree-puller. When attached to some trees of 18in. to 2ft. in diameter, which had grown out of old roots, the roots broke off at the surface of the ground, but when attached to some young redgums of a similar size growing

on their own roots on the hillside, it pulled them out at the roots. Members considered the achievement very satisfactory, taking into consideration the hard state of the soil, and thought the appliance was capable of doing all that was required. They suggested that it would pay to grub round the tree and cut off the top roots.

Clarendon, June 20.

(Average annual rainfall, 33*in.*)

PRESENT.—Messrs. White (chair), J. and L. Spencer, March, Tester, Brooks, A., A. A., T. E., and H. C. Harper, Wright, jun., Hilton, Piggot, Giles, Mathews, F. and E. Shiedow, Phelps (Hon. Sec.), and two visitors.

TREE-PULLER.—Members discussed the merits of the Bunyip tree-puller, which the Branch had witnessed at work. It was suggested that those who required the use of such an appliance should purchase one between them.

ANNUAL MEETING.—This being the annual meeting, the Hon. Secretary presented his report. Eleven meetings had been held, with an average attendance of 12 members and two visitors. Papers on the following subjects had been read and discussed:—“Oil Engines and Farm Work,” “Rotation of Crops v. Fallow,” “Land Erosion,” “Hay-making,” “Farm Management,” “Care of Implements,” “Management of Horses.” The Hon. Secretary urged members to be more regular and punctual in their attendance, and hoped efforts would be made to introduce young men as members of the Branch.

Golden Grove, June 23.

PRESENT.—Messrs. Milne (chair), Maxwell, Robertson, Tilley, Harper (Hon. Sec.).

MIXED FARMING.—This subject was introduced by Mr. Robertson. In his experience attempts at production from orchard and vineyard in conjunction with wheat and hay growing had not been successful. Other members had had happier experiences, and thought it quite practicable for a man to have a thorough working knowledge of any or all of these branches of agronomy.. Mr. Milne considered it was purely a matter of pounds, shillings, and pence, and no one need expect to make an extra hundred or two from an orchard by drawing on the working strength of the farm. The Hon. Secretary thought that the way in which mixed farming could be most profitably conducted was in producing food for stock to be consumed on the farm as well as grain. We had about the best country in the world, being able to produce to perfection almost everything they could in other temperate climates, and hundreds of things besides. Mr. Milne thought that farming in the future would be very much different from that of to-day. Farmers of the present were usually haygrowers or wheatgrowers, and nothing more. In the future they would have to work on more scientific lines, producing more from smaller areas of land as well as preserving its fertility. Mr. Milne also spoke of the superiority of farmyard manure compared with commercial fertilisers.

Gumeracha, June 20.

(Average annual rainfall, 33*in.*)

PRESENT.—Messrs. Porter (chair), Randell, Kitto, Hanna, Norsworthy, and Lee (Hon. Sec.).

PLANTING FRUIT TREES.—Discussion took place on this subject after the reading of a paper written by Dr. Stephens [which paper we regret was not forwarded for publication—Ed.]. Mr. Hanna thought land for fruit trees should be ploughed as deeply as possible and well tilled. The trees should be planted at the same depth as they had been in the nursery, with the roots spread out and sloping over a small mound in the centre of the hole. Mr. Kitto considered it unnecessary to dig holes for the trees. If the land was ploughed deeply and well worked the trees could be put in by taking out a spit or two with a spade sufficiently deep to allow the roots to slope downwards. Mr. Norsworthy liked to get straight young trees, and thought it very necessary to give thorough attention to future culture. Mr. Randell said it was useless to plant trees with the root laid out flat in a hole. One spit deep was all the preparation that was necessary to secure the best results. He was opposed to planting large trees, especially those grown in rich soil. Large trees had not root-power to withstand strong winds. He said that growing hay in orchard was injurious to trees. Mr. Porter had planted 1,200 trees and had not lost one. He thought if all fibrous roots were cut off and the soil was loose it was a simple matter to plant them by making a hole with a crowbar. This method would produce good results.

Hartley, June 21.

(Average annual rainfall, 16in.)

PRESENT.—Messrs. Stanton (chair), Clark, Brook, Hudd, Pratt, and Bermingham (Hon. Sec.).

PROTECTING HAYSTACKS.—Discussion on this subject revealed the fact that members were keenly alive to the value of proper shelter for haystacks. It was said that a shed with accommodation for 30 tons of hay could be erected for about £20, while a few pounds more would enclose the south and west sides and make all snug. A good plan was to put up the posts, stack the hay inside, and then put the roof on. Instead of putting down a bed of straw or wood for the stack, members preferred to put in a foundation of stone and sand about a foot high. This, they thought, would not draw up the moisture. Those who could not or would not put up a hay shed should do the next best thing, and thatch with the previous season's straw as soon as possible after putting up the stack. In building, the middle of the stack should be kept well up to prevent the rain from soaking in. In thatching, if the heads were left outside they would run the water off much better than the butts. Had this been done last season much valuable hay which was spoilt by the heavy rains of March last would have been saved. A great deal of hay in the district was not fit for store cattle, much less valuable horses.

Kanmantoo, June 17.

(Average annual rainfall, 17in.)

PRESENT.—Messrs. Downing (chair), Mills, Lehmann, and W. C. Mills (Hon. Sec.).

FODDER PLANTS FOR DISTRICT.—Mr. W. C. Mills read a paper on this subject. In the past a limited number of stock could be kept fat on the natural pastures and stubble, but the increased value of land made it imperative that the carrying capacity of farms should be increased by the production of suitable fodders. Near Nairne he had noticed rye and barley from a foot to two feet high in May. This had been grown with the early rains. On a dairy farm in Victoria 29 cows had earned on an average £15 each per year, and this was accomplished by having a good supply of lucerne for them and keeping them in good condition all the year. He had experimented somewhat with fodder plants, and as the result thought it best to prepare the land for them in August, September, and October. Plough deeply, manure heavily, and cultivate till all the clods were worked down. In August put in lucerne, mangolds, and kale, in September melons, pumpkins, etc., and in October maize, sorghums, &c. The first cut should come off the whole plot of lucerne in November, and it could perhaps be cut again in January and March. It was the best of fodder plants upon land suited to it. The lucerne flea, however, was a great trouble where it appeared. Lucerne also would not stand stock constantly on it. A lot of water was required to secure vigorous growth in the summer. Mangolds and kale should be held over for winter, as they were at their best in June and July. Melons and pumpkins were generally ready for use from March to July, and made a good feed for pigs and cows, with the addition of a little bran or pollard. Maize and sorghum grew well here. He preferred maize for cattle. In dry country this fodder must not be planted very thickly. One plant to every square yard was ample, and 1 bush. of maize would sow three acres if properly distributed. Successive sowings could be made in prepared land from October 1st to the end of December. The plots could be harrowed with advantage until the crop was a foot high. This was especially beneficial if the plants were at all thick, as a few pulled out made room for the others. He had grown maize for the last 20 years on all sorts of land, and had never had a complete failure, while some years he had bumper crops. He considered it one of the surest and easiest fodder crops to grow. An advantage with maize and in a less degree with sorghums and melons was that it left the land in good order for March sowings of rye and Cape barley: so that it was possible with a course of, say, mangolds and kale to feed late in autumn, maize for summer, and rye and Cape barley for winter, to have a continual course of green feed for stock. There were many other fodder plants which he had not mentioned well worth a trial, but these were proved. They involved a lot of labor, however, and unless the grower had a sure and fairly inexpensive supply of labor he had to decide if it would pay. For a small holder who could do most of it himself he would say without a doubt it would pay, especially if he could devise some means of feeding off the crops a bit at a time. No doubt a handy man could easily make a movable fence for that purpose. Members should make ensilage when the opportunity occurred, and that was nearly every year about here. All that was necessary was to shut all stock off the rich flats from the 1st September, and in November the clover, grass, dandelions, &c., were generally high enough to mow, and nothing made better ensilage. It would add to profits and comfort to have the stock in good condition all the year round.

Longwood, May 21.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. Hughes (chair), Roebuck, Clyde, Pritchard, Furniss, Vogel, W. and J. Nicholls, Coles (Hon. Sec.), and five visitors.

ROOT SYSTEM OF FRUIT TREES.—Discussion as to the functions of certain roots took place. Some members were of opinion that the finer roots growing near the surface directly influence the bearing of fruit, and were distinct from those which they termed anchor roots. Others thought that all roots gathered plant food and contributed to fruit production. Members would like some information on this subject. [The Horticultural Instructor (Mr. Geo. Quinn) has supplied the following:—"The subject of which roots supply the fruit with nourishment is a very old one amongst British horticulturists. It is generally contended that the surface fibres are those upon which the fruit depends for its sustenance. It has, however, never been thoroughly demonstrated that any particular portion of the tree is supplied by the nutrient absorbed by any definite part of the root system. It would appear as if there is confusion in the issue. In the first place strong, deeply penetrating roots obtain moisture and send up plant food from the soil over a longer period in each growing season than do those situated nearer to the surface. This apparently is due to the fact that by penetrating deeper the active terminal points are not so rapidly influenced by cold and heat as those nearer to the surface; and secondly, where the sub-layers of the soil are suitable for root action, roots descending more or less vertically appear to approximate their vigor to branches which ascend vertically, as compared with horizontal roots and branches respectively. On this assumption surface roots begin to ripen earlier in the summer, and extend that function over a long period. This shows in a sluggish condition of sap circulation throughout a tree possessing surface or horizontal roots only. This general condition is conducive to the formation of flower buds as opposed to leaf buds when the ripening of the branches on which they grow is set up rapidly by the fall of the ground temperature in the late autumn. When the normal descent of the roots has been arrived at—and this is governed by the soil—be they deep and vertical or shallow and horizontal, the condition of growth is reached when the tree bears fruit. It will continue to fruit, doubtless, if surface roots are scanty or absent; hence the fallacy of attributing to certain roots the function of being feeders of the fruit and to others feeders of the woody branches only."—ED.]

LONDON AND FIVE CROWN PIPPIN.—Members wished to know the difference between the London and Five Crown Pippin referred to in page 511 of the January issue of the *Journal*. [The true Five Crown Pippin is the London Pippin, but Dumelow's seedling is also called Five Crown Pippin by some growers.—ED.]

EXHIBITS.—There were tabled samples of good flavored strawberries, Northern Spy, Nickajack, Rome Beauty, London or Five Crown Pippin, Strawberry Pippin, and Winter Majetin apples; also barley 3ft. high, the result of eight weeks' growth. Some pears of the L'Inconnue variety were shown by Mr. Furniss. One was quite green and the other bright yellow, and these were fair samples of all the fruit on the two different branches from which they were picked. On this tree there had also been grafted another variety of pear, and the fruit of this was still green and hard. Members wished for an explanation of this. [It is impossible to account for this without careful examination of the tree. Apparently from some cause the flow of the sap in one branch has been checked.—ED.]

Longwood, June 18.

(Average annual rainfall, 37in.)

PRESENT.—Messrs. Hughes (chair), W. and J. Nicholls, Vogel, Oinn, Roebuck, Clyde, Furniss, Coles (Hon. Sec.), and two visitors.

A GOVERNMENT JAM, CANNING, AND PULPING PLANT.—Discussion on this question (fully dealt with on page 1013, June issue) took place. Members referred to the fact that the idea of shipping away honey was not long ago ridiculed; but having been taken in hand by the Government and others, honey production had become, in suitable localities, a profitable industry. If the Government undertook the pulping of fruit it would help the growers in two ways—firstly, by testing the world's markets, and, further, by safeguarding against injurious combines and so maintaining the balance of fair competition and open market. In the opinion of this Branch, although there was a great crop of canning fruit last season, the prices would have been profitable to the growers

but for certain action on the part of jam-makers. As the result of the low prices hundreds of bushels of plums were wasted on the ground and a good industry was given a setback. They would heartily support the movement to obtain such a plant as described.

EXHIBITS.—A potato named "Quick Lunch" was tabled. It was white with pink eyes, made small tops, yielded evenly in good soil. Growers thought it would do better in a drier district. A Shorland Queen apple was also shown. Mr. Furniss thought it would be a superior fruit to the Jonathan while being of a smaller class.

ANNUAL REPORT.—Eleven meetings had been held, all at homesteads of members, with an average attendance of eight and a half. Three public lectures had been delivered under the auspices of the Branch in the local institute, and a demonstration in winter pruning given by the Horticultural Instructor.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. Furniss. Members inspected the garden, and found that the wet gully land was effectively drained by means of 4in. and 2in. drain pipes. Healthy crops of barley, mangolds, and white carrots were seen, and it was said that the lastnamed made excellent food for stock. Members find this practice of holding meetings at each others homes' very satisfactory indeed. Much practical information is gained by discussing questions when the subjects are before the growers.

Meadows, June 20.

(Average annual rainfall, 34½ in.)

PRESENT.—Messrs. Ellis (chair), Brooks, Catt, Griggs, Bertram, Moriss, Nicolle, Morphett (Hon. Sec.), and three visitors.

APPLES FOR EXPORT.—Mr. Griggs reported that Jonathans sent to London by him had brought 10s. 6d. per case, while Cleopatras only realised 6s. 6d. He had found applications of basic slag to his trees very beneficial. They not only grow better wood, but bore heavier fruit of a fine quality. Mr. Griggs tabled nine varieties of keeping apples which were in splendid condition, viz., Jonathan, Cleopatra, Rome Beauty, Scarlet Pearmain, Nickajack, Strawberry Pippin, Garibaldi, Spitzenburg, and Scarlet Nonpareil.

Meningie, June 25.

(Average annual rainfall, 19 in.)

PRESENT.—Messrs. Botten, Scott, Martin, Ayres, Hacket, and Tregilgas (Hon. Sec.).

TREES ATTACKED BY GRUBS.—The Hon. Secretary read a short paper on the death of trees in the district, which, in his opinion, was frequently caused by grubs. There were two species of wood grubs, one of which attacked the trunk and the other the roots. A section of a peach tree root was displayed, from which a quantity of bark had been eaten away. The grub which attacked the trunk was exhibited, and also a piece of wood from which it had been taken. A piece of honeysuckle from a plant which had been killed by these grubs was also on view. He had noticed at Wood's Point some gum trees on one side of the river seemed to be dying, while across the stream similar trees flourished. On inquiry he found that the owners on the one side would not allow local fishermen to take grubs from under the gum trees, while the owner opposite granted permission. He attributed the healthy appearance of the trees over the stream to the fact that the fishermen were continually clearing out the grubs.

HANDPICKED SHOW WHEATS.—Members thought that if the Show authorities retained the right to purchase grain exhibited at a fixed price it would prevent the exhibition of handpicked parcels of seed which at present made it impossible for a *bona fide* exhibit of graded seed to obtain a prize.

Morphett Vale, May 17.

(Average annual rainfall, 22½ in.)

PRESENT.—Messrs. Christie (chair), Perry, Hunt, Rosenberg, and Anderson (Hon. Sec.).

FOOD FOR PIGS.—Mr. Hunt wished to know whether, in the opinion of members, boiled wheat or boiled barley was the better food for pigs. Most of those present thought

wheat was the better food, but they considered that either grain should be crushed to be of most food value.

PEAS FOR HORSES.—Mr. Rosenberg said that boiled peas were good for horses. They were very fond of them and did well on them.

HORSES HOOFs.—It was reported that a horse owned by Mr. Rosenberg, as the result of a chill taken in January last, was now gradually losing its hoofs. He wished to know how long new hoofs would take to grow. [The Government Veterinary Surgeon replies, "The time varies from 9 to 12 months.—Ed.]

Mount Pleasant, June 10.

(Average annual rainfall, 27in.)

PRESENT.—Messrs. Giles (chair), Godfree, Miller, Tapscott, Royal, Vigar, Thomson, and Maxwell (Hon. Sec.).

DAIRYING.—Mr. Tapscott read a paper on this subject. He considered the milking strain of Shorthorn to be the best cow for a dairyman to keep. These were usually nice-framed cattle, readily saleable to the butcher when milking days were over. Jersey and Alderney were good cows for milk and butter, but they required more feed than the Shorthorns in winter, and were difficult to dispose of in the sale yard. When selecting calves or heifers those having white teats should be avoided, as generally white teats were subject to sores. White cows were very thin-skinned, while those of a dark-red or roan color were hardy and did not seem to feel the cold. For feeding cows in winter he recommended cocky chaff mixed with crushed oats or bran. Mangolds were an excellent food, both for milk-production and for keeping cows in a healthy condition. They could be easily chopped up and mixed with chaff. All cows were fond of them, and they improved the flavor of the butter. He thought nosebags or mangers preferable to boxes for feeding. At night it was a good thing to give the cows grass hay. He did not put hay on the ground on account of the waste which would be sure to occur. In summer, maize and sorghum made excellent fodder. These should be planted in October. The water supply should have careful attention. Cows in many places were compelled to drink stagnant water from dirty waterholes. Drainage of milking yards should be good, and scrupulous cleanliness should be insisted upon. Cowsheds should be periodically limewashed. Milking should be done at regular hours. Unless milkers dried the cows thoroughly at each milking some would quickly go off in their milk. It was a bad practice, in his opinion, to milk without putting on the leg rope. Hands, bucket, and every utensil used for milk should be perfectly clean. The cow's udder should be either washed or well rubbed, otherwise a lot of loose scurf would inevitably fall into the bucket. It was best to separate the milk before it got cold, but if this could not be done and it had to be warmed up it was a bad practice to put the bucket of milk over the fire. It should be put into a boiler of hot water and then the milk could not be burnt. If it was necessary to use the separator twice a day it should be thoroughly washed twice a day. First in lukewarm water to remove the milk and then rinsed in boiling water. Cream should be kept in a well-ventilated, cool dairy in summer, and the dairy should be limewashed twice a year. Open pans for cream were preferable to jars with lids. The cream should be stirred night and morning, and the addition of a little salt, sprinkled on, would help to keep it in the hot months. Churning ought to be done at least twice a week, if not three times. The churn needed to be scalded out with boiling water in winter, and rinsed with cold water, to which a little salt had been added, in summer. Butter only needed to be washed once, and it was a great mistake to wash it after it had been salted. He put in 4½ozs. of salt to 10lbs. butter, or perhaps rather more if the butter was a little off flavor. The salt had to be worked well into the butter, or it would be streaky or cloudy. He would not advise putting wrappers on butter. As soon as it was made into pounds the best thing to do was to put it on a board if in winter, and on a marble slab in summer. The dairy should not be made a storeroom for other things, but should be kept exclusively for cream and butter, as these were perhaps more easily tainted than anything else. From start to finish, cleanliness was the most important factor of all. Members generally indorsed the views expressed in the paper, and laid special stress on the necessity to bail and leg-rope cows for milking, and upon avoiding heifers which had white teats.

ANNUAL REPORT.—The Hon. Secretary reported that six meetings had been held during the past 12 months. Three papers had been read, and the average attendance had been seven and one-third.

SEASON'S PROSPECTS.—It was reported that the wheat in this district was coming up nicely, and the weather was very suitable for seeding operations. The stock were said to be doing exceptionally well for this time of the year. The rainfall for May was 4·0in., and for the first five months of the year 9·07in.

Port Elliot, June 18.

(Average annual rainfall, 20 $\frac{1}{2}$ in.)

PRESENT.—Messrs. H. B. Welch (chair), H. Welch, Pannel, Brown, Chibnall, Green, Gordon, W. E. Hargreaves, and W. W. Hargreaves (Hon. Sec.).

FERTILISERS.—Mr. Chibnall read a paper on this subject, in which he referred in detail to the different classes of fertilisers and their constituents. The fact that mineral super, which is so generally used, contained only one of the ingredients necessary for the crops was referred to, and the question raised as to whether the application of some other manure would not be required.

ANNUAL REPORT.—The Hon. Secretary reported that 11 meetings had been held, with an average attendance of seven members. Papers had been read and discussed on the following subjects:—"Irrigation," "Proper Utilisation of Land," "Selling Cattle by Live Weight," "Codlin Moth," "Ensilage." Many other important subjects had been discussed.

Uraidla and Summertown, June 6.

(Average annual rainfall, 42 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Collins (chair), Hawke, Hart, Johnson, Hoffmann, Kessell, Moulds, Prentice, Day, and Snell (Hon. Sec.).

CHERRY-GROWING.—A paper on cherry-growing was read by Mr. Hawke. Unlike apples and pears, cherries would not do well in places other than the hills, and therefore he thought growers need have no apprehension regarding future markets for this fruit. They should plant more cherries, though it was never wise to put all one's eggs in one basket. Land for cherry-growing should be broken to a depth of not less than 18in., either by subsoiling with a plough or by grubbing. If the soil was not so broken the trees would commence to die back in a few years. Fifty trees properly planted would yield more cherries when, say, 10 years old than would 100 trees put in under less favorable conditions. His advice was to plant some of each of the very best varieties. Some early sorts, and others to come on during the remainder of the season. The following selection would be found to be a good one:—Purple Guigne, Twyford, Early Lyons; Then Knight's Black and Tartarian, followed by Biggareau Napoleon, Waterloo, Margaret, and Up-to-date. These would supply fruit from the beginning to the end of the season. Other varieties had certain merits, but it was a pity that some, such as Droopers, were grown at all, as they only served to keep the price low. It would be noticed that the selection named included about equal numbers of dark and light varieties. When selling it was easy to obtain orders for about half of each, but if the grower had only the light cherries he would frequently experience difficulty in disposing of them. Buyers took the light fruit where they could get the dark. He would not advise anyone to plant only dark kinds, as at some future time the taste of the public might call for the light varieties, and the boot would be on the other foot. The best stocks to work on were good seedlings. These grew larger trees, and would not be continually throwing up suckers, as the Kentish stocks did. On no account should trees be planted that were worked on Mahaleb stocks. He had about two dozen of these trees, 12 years old, and they were a failure. In a few years they would die out. The best way was to work one's own trees, and have the satisfaction of knowing what one was planting. In regard to pruning, it was advisable to head the young trees low, and for the first four or five years keep them well back, to encourage the formation of a good number of branches. These should be brought out as much as possible to produce a low tree. This class of tree would bear more fruit and it would be much easier to pick than would a high tree. After the first few years cherries did not require a great deal of pruning. Any that was necessary should be done in autumn or early winter. If left till the sap began to rise the trees were likely to gum. Manuring cherry trees, he said, was much neglected. It was essential to supply manure to the trees if good fruit was to be picked. Last year he had applied 2lbs. superphosphate, 1lb. sulphate ammonia, and 1lb. sulphate potash to each of certain trees as a test. The result was splendid fruit, both in size and color. Others manured with bone-dust were good, but not equal to those mentioned. Those trees which had no

manure produced very poor fruit indeed. Where trouble was experienced with shot-hole fungus in cherry trees he advised spraying with Bordeaux mixture just before they commenced to bloom. This would be found an effective preventive.

Woodside, May 24.

(Average annual rainfall, 31in.)

PRESENT.—Messrs. Fowler (chair), Keddie, Morcom, Rollbusch, Kleinschmidt, and Hughes (Hon. Sec.).

AGRICULTURAL BUREAU WORK.—The Chairman read the following paper on "Bureau Work":—"Without doubt the Agricultural Bureaus in this State, in the main, have been useful; at the same time they have not been taken up as they should have been, owing in a great measure to the conservatism of the producer. The farmer does not believe in co-operation, and evinces no desire to let his neighbor know what he knows, or he would be only too pleased to join an association with the object of meeting together to relate experiences and difficulties in raising stock and produce, and have them put on paper, printed, and circulated for the information of others. Take our own Branch, for instance. Where could be found a more suitable district in which the Agricultural Bureau should be a real live institution? We have mixed farming; orchards, and vegetables flourish; stock of all kinds are raised, and yet the existence of the Bureau has depended mainly on members who have not the opportunities or advantages of many who could join this Branch. It requires no very great stretch of imagination to picture what our Branch might be when we know the material we have within a radius of a few miles to make it a useful and popular means of gaining knowledge. The Branch in this place will never fulfil its purpose unless its membership is considerably increased by the addition of a number of producers willing to give their knowledge to others. The district is one of the oldest settled in the State, and the experience gained in cultivating the soil and raising stock must be considerable. As we are now commencing a new year, I would suggest that the members present make a special effort to induce some of the farmers and gardeners to join; say, that each one will undertake to get a fresh member or more who is a tiller of the soil, orchardist, or stock-raiser, and thereby help to make the institution what it ought to be. I can see no reason, unless it is unwillingness to co-operate for each others' welfare, to prevent this Bureau from having a large membership and intensely interesting meetings, attended by numbers of young men as visitors." Members thought the paper contained a fair statement of the position of this Branch, and promised to take more interest and attend with more regularity in the future.

CANARY GRASS.—Mr. Keddie recommended all farmers to plant an acre or two of canary grass (*Phalaris perennialis*). He considered it a splendid winter grass. He also spoke highly of Paspalum as a summer grass. Members differed in opinion regarding the value of the latter. Some had found that it did not grow to any height, and seemed in need of summer rain to make a success of it.

STOCK COMPLAINTS.—Mr. Hughes reported that several of his farm horses were suffering from a bad cough. There was a discharge from the nostrils, and when working the animals seemed unable to breathe properly. This had been going on for some months now, and he had tried several remedies without success. The symptoms were somewhat similar to those attending the influenza which was prevalent last year. Members could offer no advice as to treatment. [The Government Veterinary Surgeon recommends the following treatment:—"The animals should be isolated, throats rubbed thrice daily with stimulating liniment (e.g., Elleman's embrocation), and the horses should be fed on greenfeed and bran mashes, and should receive a dessert spoonful each of saltpetre and hyposulphite of soda in the drinking water or bran mashes thrice daily. Steam the head with hot bran, in which a little oil of eucalyptus has been mixed."—ED.]

SOUTH-EAST DISTRICT.

Kalangadoo, June 11.

(Annual average rainfall, 9in.)

PRESENT.—Messrs. Crouch (chair), Bennett, Earle, Gibb, J. and R. Boyce, Guerin, Tucker, Mitchell, and Sudholz (Hon. Sec.).

MANURES FOR DISTRICT.—Discussion as to the best manures for the district took place. Mr. Earle considered that greenstuff ploughed in gave as good a result in these parts as most manures. He had cropped one paddock for 14 consecutive years and had not applied any but green manure. He allowed the weeds to grow and then ploughed them in, using a skim coulter. He always obtained good crops. Most of those present considered bone super. gave the best results in this district.

AN AFRICAN GRASS.—Mr. J. Boyce tabled some grass known as African Veldt. It was grown by Mr. J. Clarke, who obtained a few cuttings from his son in South Africa about two years ago. Mr. Clarke now had a patch of this grass about half a chain square, and 2ft. high. It kept green all through the summer, and he had now collected sufficient seed to sow one and a half acres.

Keith, May 21.

PRESENT.—Messrs. Lock (chair), Lambert, Schultz, Morcolm, Crouch, Draper, Hutchings, McLean, Godlee, Leashman, and Dall (Hon. Sec.).

POULTRY-KEEPING.—Mr. Leashman read a paper on poultry-keeping. Farmers sometimes said that fowls pulled the haystacks to pieces and destroyed more than they ate, and then laid hardly any eggs. It would be frequently found in such cases that little or no attention was paid to the needs of the poultry. Their drinking vessels, if they had any, would be seldom cleaned out and only haphazardly supplied with water. Egg-collecting was left to children to do, and consequently a find of eight or nine addled eggs beneath a hen was hailed with delight and promptly put by for market. He had recently been at a farm where over 200 head of poultry were kept, whose owner complained that they did not pay. Some of them appeared to be very old and tough, and it was a wonder that some of them lived at all. Poultry-keeping properly managed did pay, in spite of statements to the contrary. Fowls were worthy of a good place on the farm, and if fed and watered properly and cared for in a systematic manner would lay well. He preferred White Leghorns for summer laying and Silver Wyandottes for winter. The latter were also good sitters and table birds. A breeding pen for each breed was necessary, and also a large pen for the other hens. Eggs for home use and market purposes should be infertile. They should be collected twice daily, and if dirty should be washed. When available, every three or four days, a batch of nice clean eggs should be sent to the market. Eggs were porous, and should be kept in a clean cool place where they would not be tainted or absorb foreign flavors. Cleanliness in the treatment of fowls was of first importance. Yards and pens should be kept scrupulously clean. Houses frequently needed to be limewashed and perches treated with kerosine. He preferred wedge-shaped hens with snake-like heads and bright eyes. It was not wise to breed from young pullets, but from fully-developed birds. A patch of lucerne for the fowls was a paying investment. Only the best layers should be used to breed from and a record of eggs should be carefully kept. Lime or sharp grit was needed in the pens, and greenfeed should be given if the grass had become long and rank. Non-layers should be continually weeded out. Meals should be given at regular intervals. It was a good plan to frequently limewash nests and keep clean hay, straw, shavings, or pine needles in them. Two or three nest eggs in each nest did a lot to prevent fowls from eating eggs. Perches should be on a level, and not one higher than another; 12in. to 18in. from the ground was the best height. It should be remembered that a broody hen sitting on a fertilised egg for 12 hours spoiled its flavor. At present local farmers were at a disadvantage on account of the want of facilities for marketing eggs, but the establishment of an egg circle here would meet that difficulty satisfactorily. In reply to a question Mr. Leashman said he was in favor of using an incubator. Mr. Lock thought people kept birds until they were too old to be profitable.

Millicent, June 14.

(Average annual rainfall, 28 $\frac{1}{2}$ in.)

PRESENT.—Messrs. Stewart (chair), Oberlander, Serle, Mutton, Mullins, Hart, Harris, and Thompson (Hon. Sec.).

DRY BIBLE.—Mr. Serle contributed the following paper on "Dry Bible in Cattle":—"This disease is known as dry bible, or impaction of the rumen. I have studied the ailment for the past five or six years. After an unusually full meal the grain often becomes impacted in the animal's stomach, causing its temporary paralysis, the whole mass being then like so much sodden stuff in a leather bag. Great distress necessarily follows, which

is aggravated when fermentation sets in, death often resulting from suffocation or, in a more protracted case, from nervous prostration and blood poisoning. It will have the same outward appearance of tremendous distension as in tympanitis, but when the bloated section is touched it is found to be soft and pithy, so that when dented the dent remains or slowly rises. Fever sets in and slowly increases as the disease makes progress. There is a great tenderness in the right side, just below the ribs, where a hard round substance can be felt. The fever grows more intense; and delirium and vertigo soon set in, causing death. The tongue and jaws become paralysed, and have not the power to throw up the food and chew the cud, and the latter lies dormant in the first stomach. My advice would be to make an incision into the first stomach and empty it with the hand. Before sewing up the wound, pour in carefully the purgative—Epsom salts 12ozs., ginger 1oz., gentian 1oz., syrup 4ozs., water to make 2qts. After this operation the cow should be given only soft food, such as gruel, which would be easily digested. But this operation would require some skilful person. To prevent this disease the cow must be given soft food, such as green stuff or steamed chaff, with a little bonemeal in it." In the discussion Mr. Hart said he used to feed his cows on straw, but one night a fine healthy cow got at the manger before the others and cleaned it out. She was dead next morning, and on opening her he found nearly a barrow load of straw packed tightly inside. Mr. Mutton did not think cattle would contract the disease if they were given judicious changes of feed and were looked after. This was the general opinion of the members. Mr. Serie replied that any cow was liable to catch the fever which in nine cases out of ten preceded the disease. Irregular feeding was to blame in most cases. He had been a butcher for many years, and claimed to thoroughly understand the nature of a beast's internal organs. All cattle were subject to dry bible. No matter how a cow was fed she was liable to contract a common fever. It set in very quickly, and the opening which led into the stomach was affected to such an extent that at times it was completely blocked. Then that animal, if fed during the fever, was certainly booked for impaction or dry bible. Although impaction itself was not contagious, dry bible fever was infectious.

MUSTY HAY.—Mr. Mutton had noticed that a heavy mortality amongst the horses in the North was attributed to musty hay. He had fed his cattle and horses for years on musty stuff, and was inclined to the belief that if a little green stuff had been mixed with the hay the trouble would have been averted. The members concurred with this view, but mentioned the danger of feeding the green with the dry in excessive quantities. It was regarded as very risky to turn horses fed regularly on dry chaff on to a good patch of green feed. Musty feed should always be damped.

EXPERIMENTAL WORK.—Mr. Mullins said the experimental block on his farm had been divided into 20 plots, and all had been sown with rye, each plot being treated with a different course of manure. The work was done under the supervision of the manager of the Kybybolite Farm. It was reported that at least 30 acres of land had been placed at the disposal of Mr. Colebatch for experimental purposes. He had five acres from Mr. Schinckel and five from Mr. R. Foster, at Rendelsham. This was all dry peat land. Mr. Holzgrefe, of Millicent, had handed over 10 acres, in two plots, of grey, marly ground. Mr. Mullins had 10 acres of sand and fern country on the Millicent Road, part of which had been under treatment for some time past.

Mount Gambier, June 11.

(Average annual rainfall, 31½in.)

PRESENT.—Messrs. Sassanowsky (chair), Ruwoldt, Sutton, G. Collins, Pritchard, Kennedy, Watson, Wedd, Major, Holloway, Buck, Keegan, Mitchell, Pick, Innes, Schlegel, and D. Collins (Hon. Sec.).

ANNUAL MEETING.—This was the annual meeting of the Branch, and reports were submitted by the Chairman and Hon. Secretary to the following effect:—During the year 10 meetings had been held, with an average attendance of 17 members. One meeting had lapsed on account of Congress, and another to enable the Government Veterinary Surgeon to deliver a lecture to the public. The average attendance had been better than any previous year in which the present Hon. Secretary had held that office. The following subjects had been introduced by various gentlemen and discussed during the year:—“Treatment of New Zealand Pastures,” “White Clover in South-East,” “Parturition,” and “Food Value of Cereals Grown on Rich and Poor Soils.” Messrs. Clark and Schlegel had each given accounts of their trips to Europe and America, and many matters of importance were thereby introduced and discussed. The Government Veterinary Surgeon had addressed one of the meetings and the Superintendent of Government Experimental

Work in the South-East (Mr. Colebatch, B.Sc., M.R.C.V.S.) had discussed some of his proposed operations with the Branch. Interesting visits had been paid to the Government Experimental Farms at Kybybolite and Murray Bridge, and to other settlements on the river banks, where some of the possibilities of agriculture with irrigation had been seen. A total amount of £11 11s. had been subscribed by members to the fund for perpetuating the memory of the late Albert Molineux. Members, after adopting the reports, were made the guests of the Chairman, and after partaking of refreshments the meeting closed.

Naracoorte, May 14.

(Average annual rainfall, 22in.)

PRESENT.—Messrs. Coe (chair), Wright, Forster, Caldwell, and Schinckel (Hon. Sec.).

CONFERENCE REPORTS.—Messrs. Schinckel and Forster gave very complete reports of the Conference held at Bordertown on April 20th, but as the proceedings were fully reported in the May issue of the *Journal* we are unable to reprint it.

Naracoorte, June 11.

(Average annual rainfall, 22in.)

PRESENT.—Messrs. Forster (chair), Wright, Williams, Bray, Caldwell, Coe, and Schinckel (Hon. Sec.).

WHEAT YIELDS OF THE STATE.—Discussion on the question of yields of wheat took place. The Hon. Secretary, in compliance with a request, read extracts from the report of the Department of Agriculture. The yields for the last 20 years were as follows:—1889, 7·55bush. per acre; 1890, 5·37bush.; 1891, 4·8bush.; 1892, 6·5bush.; 1893, 7·52bush.; 1894, 4·56bush.; 1895, 4·11bush.; 1896, 1·40bush.; 1897, 2·38bush.; 1898, 4·54bush.; 1899, 4·38bush.; 1900, 5·53bush.; 1901, 4·36bush.; 1902, 3·38bush.; 1903, 7·43bush.; 1904, 6·32bush.; 1905, 11·28bush.; 1906, 10·36bush.; 1907, 10·54bush.; 1908, 11·45bush. There were no official figures yet for the 1909-10 yield, but 12bush. had been estimated as the average. [As shown elsewhere, the actual yield exceeded 13½bush. per acre.—ED.] During the last five years there had undoubtedly been a great improvement in the yield. He did not know how much of it was owing to fertilisers and improved methods of agriculture; it was mostly due to a succession of good seasons. For 15 years prior to 1905 the average yield did not once go into double figures. The Chairman did not think the increased yield was due so much to improved agriculture as to good seasons. In the lands that had been opened up in Pinnaroo, the West Coast, and other districts good yields had been obtained from them when the seed had been thrown into the ground and scarified. There might have been some improvement in methods of agriculture in the old districts, and no doubt fertilisers had done something towards increasing the yields. Mr. Coe said he knew a farmer near Port Germein who cultivated mallee land and had raised crops for 11 years in succession without ploughing, and he had good results. Members thought that they would have to experience a bad season to realise how much improved methods of agriculture had done to raise the yield of wheat.

TREE-PLANTING.—Mr. S. H. Schinckel read the following paper on "Forestry":— "It must be apparent to all that most of our useful timber is becoming more scarce every year. Some thousands of the best red gum, blue gum, and stringybark have within the past 50 years been cut down for posts and various other purposes. Not only have these larger trees been cut down, but many other smaller trees, suitable for firewood, are now in some places almost extinct. Not 40 years ago the best of firewood was obtainable within one mile of this town. Last winter I saw firewood being carted here a distance of 16 miles. Suitable timber for post and sawing purposes is also getting very scarce, yet very little seems to have been done by landowners in trying to replace some of the more useful kinds. Surely the time has arrived when every good man on suitable land should give a little of his land and time to the planting of a few forest trees. Certainly trees will not grow everywhere, but many useful trees can be profitably grown in this district. The Forest Department will forward to any person desirous of planting almost an unlimited number free of charge. The only cost is for packing and railage, and that is a very small amount. The Department distributes a large number of young trees in this district annually, but it is a question whether the young trees receive the attention they deserve. I think the tree best suited for this district is the sugar gum, which will grow in almost any soil. The Remarkable pines do best in a rather light soil, but will

also grow well in strong and heavy land. The South Australian blue gum should also be a useful tree to grow. This tree does best in a light soil, but will also grow on a chocolate soil, or even limestone. The South Australian red gum is probably the most useful timber in our State. It generally grows over a clay subsoil. The surface soil may be heavy or light, but a clay subsoil seems indispensable. In planting any of these trees it is very important that suitable land should be chosen. The sugar gum and Remarkable pine will not grow well when the land gets very wet in winter. The land intended for planting should be well ploughed in May or June, and then kept well-worked until August. The young trees should then be carefully planted. Good preparation of the soil in heavy land is just as important for growing trees as it is for a wheat crop. The thorough working of the soil, where it is not too wet, will greatly help to conserve the moisture for the young trees during the first summer, and this is very necessary. When planting young pines I have found it very beneficial to give each tree a good watering. About October or early in November the surface soil should be lightly hoed around the young trees, but they must not be disturbed. It is useless planting these young trees unless they are protected from stock for the first few years. Some of these trees can be grown near the homestead of nearly every farm in this district, while they should also be planted in the paddocks to provide shelter for stock. With ordinary care it will take a few years before these trees provide much shelter for stock, but one has the pleasure of seeing them grow, and we may feel assured that he who plants good trees now will be blessed by those who follow him." Discussion took place on some points. The Chairman said that undoubtedly timber was getting scarce in the district, and it was highly necessary that landholders should do more systematic tree-planting. In the scrub it would pay to cut down the old stringybark trees, as young ones came up at once in their place, and they made useful timber for fencing. The young trees grew more straight than the old ones. Mr. Schinckel mentioned that there were many localities in the district where timber grew naturally if they only fenced in patches of land here and there to keep stock off it. The whole of the Hynam country and a good deal of the Naracoorte Estate would grow, without planting, a most useful timber, principally red and South Australian blue gum. The natural gum trees in the district made excellent timber. He knew sugar gums did well in the district, but he did not know much about their value as a timber. Mr. Coe said if protected from stock, belts of natural timber could be grown all over the district. They only needed to thin the trees out. Large quantities of trees were springing up on many of the roads and thriving without any attention: and in the same way timber would spring up in many parts of the district if a little attention was paid to the trees. The sugar gum made good timber.

ANNUAL REPORT.—The annual report showed that seven meetings had been held, with an average attendance of nearly seven.

Penola, May 14.

(Average annual rainfall, 26 $\frac{1}{2}$ in.)

PRESENT.—MESSRS. STRONG (chair), PEAKE, ALEXANDER, WILSON, MILLER, MCBAIN, FULLARTON, McDONALD, MAXWELL, RICKETTS, AND ADAMSON (Hon. Sec.).

PICKLING WHEAT.—Mr. Ricketts had had good results from a 1 $\frac{1}{2}$ per cent. solution of copper sulphate (bluestone). He tabled some seed which had been placed between wet flannel for three days and 90 per cent. of which had germinated. Mr. McBain said a solution of $\frac{1}{2}$ per cent. would not be effective as a preventive of smut. In answer to a question, he said the germination of seed would not be seriously affected by the grain being in contact with super. for a considerable time in dry weather, unless there was free acid present in the manure.

BUREAU WORK.—Speaking of the objects of the Agricultural Bureau, Mr. Peake said the benefit of all engaged in agricultural, pastoral, and horticultural pursuits was the primary object in establishing a Branch here. Lately, however, there had been a great lack of interest on the part of members, and it was time some move was made to improve matters. It was decided to prepare a list of topics for discussion, and that members should deal with them in papers by turns. It was also arranged that members should be made aware beforehand what the subject for discussion would be.

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